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Mineral Industry Report 1975 Yukon Territory EGS 1976-15

W. D. Sinclair
J. A. Morin
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M. Marchand

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Canada

Dept. of Indian Affairs & Northern Development

MINERAL INDUSTRY REPORT

1975

YUKON TERRITORY

BY

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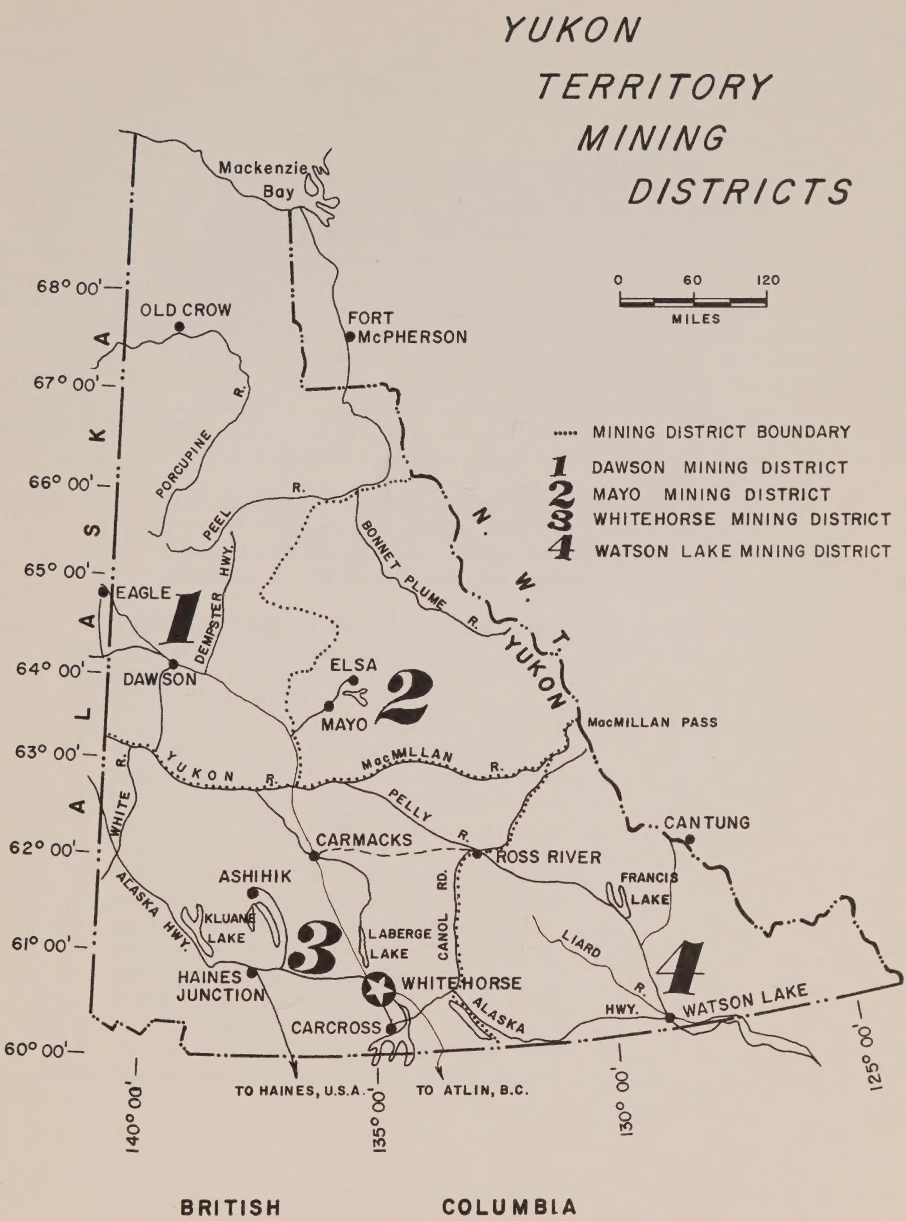

YUKON TERRITORY MINING DISTRICTS
0 60 120
MILES
MINING DISTRICT BOUNDARY
1 DAWSON MINING DISTRICT
2 MAYO MINING DISTRICT
3 WHITEHORSE MINING DISTRICT
4 WATSON LAKE MINING DISTRICT
Mackenzie Bay
FORT McPHERSON
OLD CROW
PORCUPINE R.
PEEL R.
DEMPSTER HWY.
BONNET PLUME R.
N. W. T.
YUKON
EAGLE
DAWSON
ELSA
MAYO
MacMILLAN PASS
YUKON R.
MacMILLAN R.
PELLY R.
WHITE R.
CANTUNG
CARMACKS
ROSS RIVER
CANOL RD.
FRANCIS LAKE
ASHIHIK
KLUANE LAKE
LABERGE LAKE
ALASKA HWY.
LIARD R.
HAINES JUNCTION
WHITEHORSE
CARCROSS
WATSON LAKE
TO HAINES, U.S.A.
TO ATLIN, B.C.
ALASKA
68° 00'
67° 00'
66° 00'
65° 00'
64° 00'
63° 00'
62° 00'
61° 00'
60° 00'
140° 00'
135° 00'
130° 00'
125° 00'
BRITISH COLUMBIA

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INTRODUCTION

This report is a review of the Yukon mineral industry for 1975 by officers of the Geology section, Northern Natural Resources and Environment Branch, Department of Indian and Northern Affairs. It includes descriptions of work conducted on mineral claims by individuals and mineral exploration companies and operating summaries of the several producing mines in the Yukon. Earlier records of mineral industry activities are presented in the Annual and Summary Reports of the Geological Survey of Canada (1898 to 1933), Memoirs of the Geological Survey of Canada (1934 to 1940), Papers of the Geological Survey of Canada (1960 to 1968) and Mineral Industry Reports of the Department of Indian and Northern Affairs (1969 to 1974).

Information in this report was obtained from visits to mineral properties, from personal communication with individuals and from technical reports, trade journals, newspapers, publications of the Geological Survey of Canada and the monthly reports of the District Mining Recorders. Considerable information was provided by exploration companies in completing and returning the questionnaires on each of the properties on which work was conducted. The cooperation of industry in this regard is gratefully acknowledged. A great deal of valuable information is contained in the geological, geochemical and geophysical reports accepted for credit as assessment work by the Department of Indian and Northern Affairs. A list of assessment reports, both confidential and those available for inspection, are included in the list of Technical Reports prepared by the Canada Center for Geoscience Data for the Department. These reports are listed by NTS locations and are produced annually in February of each year. The assessment reports are currently released for public inspection six months after the claims (on which the work was carried out) have lapsed.

In this report, activities of the mineral industry are divided into lode mining and exploration, coal mining and exploration and placer mining. Each of these sections are further subdivided into the separate mining districts in the Yukon (see the frontispiece). Individual properties in the various mining districts are then listed in order of their occurrence based on the National Topographic System. The location of each property is given by its National Topographic System designation of the 1:50,000 map-sheet in which the property lies and by the latitude and longitude of the centre of the property. In cases where a property involves a large number of claims or covers more than one NTS sheet, several latitudes and longitudes and more than one NTS designation are given. The name or names given to a property are generally the names of the claims that constitute the property. However, if there is a name by which a property was originally or formerly known and which is commonly used at present, then this name takes precedence.

During the 1975 field season, W.D. Sinclair visited lode mining and exploration properties in the Whitehorse and Watson Lake Mining Districts and carried out additional field work in the Minto area. J.A. Morin visited lode mining and exploration properties in the Mayo Mining District and carried out field investigations in the Moosehorn Range area in the Whitehorse Mining District. D.B. Craig visited placer mining properties in the Yukon Territory and lode mining and exploration properties in the Dawson Mining District. In addition to the above, W. Styan carried out detailed investigations of the King Lake and Kreft-Takacs properties in the Whitehorse area and of the Laforma property in the Dawson Range. The results this work are embodied in the respective property descriptions contained within this report. M. Marchand, who joined the staff of the Geology Section late in 1975, has contributed significantly to the writing and organization of this report.

Asterisks (*) placed after the claim name indicate that the property was visited by one of the geological staff. The addresses of the companies have been consolidated and placed in a section at the end of this publication.

Facilities of the Geological Section

The Geology Office sells topographical, geological, aeronautical, and land-use maps, as well as Geological Survey of Canada publications, covering the Yukon and some adjacent parts of B.C. and the N.W.T. A library of G.S.C., B.C. Dept. of Mines, Alaska Bureau of Mines, U.S.G.S. Alaska publications, and other geological books and journals is available for consultation. Some open file reports on the Yukon are also available for viewing. A sizeable collection (25,000) of air photos covering the Yukon from Latitude 60° to 65° is available for use in the office as is the latest catalogue of Yukon Air Photos from the National Air Photo Library. An updated computer list of 'good' quality photos of the 1972-1975 satellite [LANDSAT] imagery of the Yukon is included in the Air Photo catalogue. We also have a LANDSAT mosaic of the cordillera on display and a nearly complete collection of colour LANDSAT photos of the Yukon

The H.S. Bostock Core Library, situated across the street from the Geology Office, contains drill core from various Yukon mining properties, some available for inspection and the remainder confidential. The core library also contains working quarters equipped with diamond saws, a core splitter, a vibrating polisher, rock staining facilities and fume hood. A petrographic microscope, with capabilities for both transmitted and reflected light, and a binocular microscope are also situated in the core library. The Geology Office acquired the McPhar Spectra 44, a four channel gamma-ray spectrometer and a new UV light for the '76 field season. The equipment and instruments are available for use by industry personnel on arrangement with one of the geologists.

The office is staffed by four geologists who welcome visits by exploration personnel when they are in town. The office is situated at 200 Range Rd. in the Takhini sub-division, about halfway between downtown Whitehorse and the airport, at the top of "Two Mile Hill". The staff and their telephone extensions are listed below:

Doug Craig, Regional Geologist 136; Dave Sinclair, District Geologist 137
Jim Morin, District Geologist 138; Mike Marchand, Staff Geologist 136
Beth Phillips, Clerk & Map Sales 140.

Telephone - 403-668-5151 Telex - 036-8-342
Mailing Address:

Geology Section
Dept. of I.A.N.D.
200 Range Road
Whitehorse, Yukon
Y1A 3V1

TRANSPORTATION FACILITIES

Whitehorse, with a population of roughly 14,000 in 1975, is the capital and main distribution centre in the Yukon. It is serviced by ship and rail via Skagway and by truck, bus and air from Edmonton and Vancouver. From Whitehorse, all-weather surface transportation routes connect to Dawson, Carmacks, Faro, Ross River, Watson Lake, Haines Junction, Alaska and points between. (Regular bus and freight services are available.) Minor roads connect with many mining properties, ranches and timber leases. Boats or barges are also used on occasion to transport heavy equipment and fuel on the Yukon River. Fixed wing and helicopter aircraft are available for charter at Whitehorse, Ross River and Watson Lake throughout the year and at numerous other points during the summer months. Representative costs for transportation in the Yukon during 1975 are given in Table 1.

TABLE I

Transportation Costs, Yukon Territory, 1975

RAIL AND BOAT

Ore and concentrates, Whitehorse to North Vancouver

Lead, zinc and copper con's (30,000 lb. carloads)...$16.00/ton
Asbestos fibre, in sacks....1st 60,000 tons.........$19.34/ton
....next 40,000 tons........$17.14/ton
in excess of 100,000 tons...$13.84/ton

Mining equipment and related supplies - North Vancouver to Whitehorse (dollars/100 lb.)

	10,000 lb.	24,000 lb.	36,000 lb.
Machinery	4.35	3.80	3.70
Petroleum Products	4.65	4.15	4.00
Drilling mud, plywood	4.35	3.80	3.70

Backhaul rate up to 12 months is 2/3 of applicable commodity rate.

TRUCK

Basic industrial rates - Whitehorse from Edmonton and Vancouver (dollars/100 lb.)

	100 lb.	1,000 lb.	5,000 lb.	10,000 lb.
From Edmonton	13.75	8.53	7.15	6.20
From Vancouver	15.55	10.69	8.54	8.05

Table I (cont'd)

BUS

Express rates - Whitehorse from Edmonton and Vancouver (dollars)

	1-2 lb.	2-10 lb.	40-50 lb.	90-100 lb.
From Edmonton	4.30	6.50	14.65	18.25
From Vancouver	4.70	6.50	15.60	22.80

AIR

Air Express rates - Whitehorse from Edmonton and Vancouver (dollars)

	min. 1 lb.	min. 3 lb.	10-11 lb.	16-20 lb	91-100 lb.
From Edmonton	-	11.00	13.30	16.00	40.00
From Vancouver	11.00	-	13.85	17.00	45.00

Air Freight rates - Whitehorse from Edmonton and Vancouver (dollars)

	min. 30 lb.	min. 50 lb.	50-100 lb.	over 500 lb.
From Edmonton	-	13.00	.26/lb.	.24/lb.
From Vancouver	8.00	-	.26/lb.	.22/lb.

CHARTER AIRCRAFT

Type	Rate per hour	Rate per mile
Fixed Wing		
Cessna 185	$120.00	$0.90
Beaver	125.00	1.20
Turbo Beaver	175.00	1.35
Otter (single)	170.00	1.55
Otter (twin)	305.00	1.90
Beech Travelair	145.00	0.80
Helicopter (fuel supplied by charterer)		
Bell 47G-3B-1	$180.00	
Bell 47G-3B-2	180.00	
Bell 206B	290.00	
Hughes 500C	260.00	
Hiller 12E	160.00	

MINERAL PRODUCTION OF YUKON

Mineral production in Yukon Territory in 1975 came from three underground and two open-pit mines which together produced lead, zinc, copper, and silver concentrates, asbestos fibre and coal. The current and cumulative values of the mineral production summarized in Table II show a preliminary value of $229 million for 1975 compared with $171 million in 1974. Production of copper decreased slightly while that of lead, silver, zinc and asbestos increased significantly. This was due mainly to increased production at the Anvil Mine. Individually, the Anvil Mine continued to be the Yukon's leading mineral producer ($150 million) followed by Clinton Creek ($32 million), Whitehorse Copper Mines ($15 million) and United Keno Hill Mines ($16 million). Production of coal from the Tantalus Butte Mines was used almost entirely for heating and concentrate drying at the Anvil Mine.

TABLE II

Mineral Production, Yukon Territory

Product	1973	1974	1975[1]	Cumulative totals[1] 1886-1975
Gold...$	2,032,502	4,111,631	4,245,000	278,907,486
ounces	20,856	26,472	26,000	
Silver...$	15,342,856	26,800,905	29,434,000	234,957,995
ounces	6,073,973	5,789,783	6,516,000	
Lead...$	38,013,324	41,194,600	56,260,000	280,583,867
pounds	235,522,452	198,950,056	276,466,000	
Zinc...$	61,167,027	60,899,995	95,159,000	365,836,876
pounds	253,321,575	174,498,553	253,757.000	
Cadmium...$	45,718	17,331	11,000	6,362,566
pounds	12,560	4,358	4,000	
Copper...$	14,791,665	15,571,426	11,580,000	73,886,410
pounds	23,186,245	20,086,720	18,180,000	
Asbestos...$	13,915,140	22,752,400	31,970,000	128,961,070
tons	100,734	90,896	112,000	
Coal...$				
tons	19,915	17,027	25,712	
TOTALS	150,667,311	171,348,288	228,659,000	1,381,814,816

[1]preliminary figures. Cumulative totals for 1973 and earlier include production of nickel and platinum.

In the Watson Lake Mining District, Canex Placer continued to work on their lead-zinc deposit at Howard's Pass, completing nearly 12,000 feet of diamond drilling.

Noranda Exploration began a re-evaluation of the McMillan lead-zinc deposit near Hulse Lake and carried out a program of diamond drilling totalling over 8,400 feet.

Granby Mining drilled 4,600 feet on the MEL lead-zinc-barite property near Otter Lake. The main zone on the property was estimated to contain 3 million tons grading approximately 8 per cent combined lead-zinc.

Exploration activity in Mayo Mining District was considerably diminished in 1975 compared to 1974. A good portion of the continuing activity involved detailed property work and evaluation. As in 1974, the carbonates received the greatest share of attention. In the Corn Creek area, Cominco conducted diamond drilling programs on the DF and PING claim groups over showings in Upper Hadrynian dolomite. On the Goz Creek property, the drilling program of Barrier Reef Resources Limited led to the delineation of 12 million tons of ore averaging 8 per cent zinc. McIntyre Mines Limited drilled their TARA (Nadaleen Mountain) and TOM (south of Bonnet Plume Lake) claim groups for lead-zinc. In the northern part of the Bonnet Plume River area, Archer-Cathro (Ogilvie Joint Venture) conducted 1,328 feet of diamond drilling on their FLUNK claim group and determined weak sphalerite mineralization in a Lower Cambrian dolomite unit for at least 1,400 feet.

In the Macmillan Pass area, Clyde Smith's Ogilvie Joint Venture initiated a drilling program on the JASON claim group in their search for Pb-Zn-Ba mineralization similar to the nearby TOM deposit. Union Carbide conducted a drilling program on Mount Armstrong to evaluate several pods of scheelite-bearing sulphide skarn.

LODE EXPLORATION

Mineral exploration activity in Yukon Territory was responsible for the spending of $16.5 million in 1975, up from $11.9 million in 1974. In addition to this, feasibility studies and underground drifting on the GRUM lead-zinc deposit cost $4 million. Activity consisted mainly of assessment work and drilling on claims staked in the past two years. This is shown by the decrease in total number of claims staked in Yukon, from 13,734 in 1974 to 8,559 in 1975. (Table III)

TABLE III

Mineral Claims Staked, Yukon Territory

Mining District	1971	1972	1973	1974	1975
Dawson	1,054	669	1,168	1,504	1,695
Mayo	1,026	1,784	2,587	6,038	1,609
Watson Lake	1,245	2,470	2,509	1,325	1,801
Whitehorse	4,380	1,922	3,119	4,867	3,454
TOTALS	7,705	6,845	9,383	13,734	8,559

In the Whitehorse Mining District, the most significant activity occurred in the Anvil Range. Kerr Addison began a $6 1/2 million program of surface and underground development on the GRUM property five miles northwest of Faro. Work to date has included installation of a semi-permanent camp, an underground decline roughly one-half mile long, and 68,000 feet of surface diamond drilling. Cyprus Anvil also conducted diamond drilling on several properties in the Anvil Range. A number of other companies, including Welcome North, carried out surface exploration in the area.

The discovery of gold in quartz veins in the Moosehorn Range area resulted in the staking of a large number of claims in this area. Although subsequent drilling on properties owned by Great Bear Mining Limited and Claymore Resources Limited was discouraging, interest was aroused later in the season in the potential for placer gold deposits in the area.

In the Dawson Range, Western Mines carried out 5,000 feet of diamond drilling on the CAR claims southwest of Prospector Mountain and Rayrock Mines completed over 7,000 feet of diamond drilling on the Laforma property on the southwest flank of Freegold Mountain.

In the Whitehorse Copper Belt, Whitehorse Copper Mines drilled several skarn occurrences, including the Kreft-Takacs property on Jackson Creek. United Keno Hill Mines drilled 5,000 feet on the King Lake property northwest of Whitehorse.

Progress Report on The Clinton Creek Asbestos Project

by
M. Htoon
Department of Geological Sciences
University of British Columbia

GENERAL GEOLOGY

The Clinton Creek asbestos deposit is situated at latitude 64°23' and longitude 140°43' in western Yukon. (Fig. 1) About a 60 square mile area around the deposit was mapped during 1975 at a scale of 1:12,000. The mine site itself was mapped at 1:12,000 (1 inch = 100 feet). Rock exposure is less than 5 per cent and most outcrops are at the mine and along road sections. A few exposures occur along streams and very steep sides of hills.

Country rocks are metamorphic rocks of the Yukon Group, whose age, though uncertain, is believed to be late Precambrian and/or early Paleozoic. Specific lithologies found within the area include thin-bedded limestone, sandstone and shale in the sedimentary category; argillite, marble, slate, phyllite, quartz-mica schist, chlorite schist, talc-chlorite schist, quartz-biotite schist, quartzite and quartz-biotite gneiss in the metamorphic group; and diorite, andesite, serpentinized ultramafites and serpentinites in the igneous group. Quartz-carbonate rock is found as an alteration product here and there throughout the area adjacent to some serpentinite bodies.

There are four major structural trends in this area that could be delineated only by detailed mapping of individual outcrops. Probably the oldest and most complex trend (300° to 315° azimuth) is roughly parallel to the direction of the Tintina Trench. The second oldest trend is approximately east-west (080° to 090° azimuth). The third and fourth structural trends are southwesterly and northerly, but no evidence has yet been found to show the relative ages of these two youngest structural elements. North-trending structural features are not well preserved within the mapped area.

There are several small ultramafic bodies intruded into the metamorphic rocks of this area. Thus far, 18 ultramafic bodies of variable size have been mapped by the author within the principally metamorphic terrain. Almost every serpentinite mass contains chrysotile, but the amount and quality is highly variable. In general, ultramafic bodies intruded into schists contain very little fibre, whereas those intruded into limy argillites have appreciably more fibres. Porcupine and Snowshoe ore bodies are in contact with limy argillites and intercalated limestone. The ore-bearing, ultramafic body trends northeast in an elongated dome shape. Its upper surface plunges 10° to the southwest beneath graphitic, limy argillites. The ore zone is restricted to the northwest side of the serpentinite body. Its northwest end is terminated by a limonitic-silica-carbonate zone which acts as a hanging wall. To the southeast the ore body is bounded by a highly sheared serpentinite zone.

The overall distribution pattern of chrysotile vein orientations appears random on standard stereonet plots. Examination of individual chrysotile veins in a specific shear zone, shows them to be curvilinear, indicating an explanation of the apparent random dispersion of vein orientations. If generalized attitude of individual veinlets in a shear zone are considered, particular trends are apparent. There are 4 such trends that correlate with the major structural trends of the region. The maximum concentration of generalized vein orientations (300° - 315°) parallels the oldest structural alignment of the area. A second vein concentration trends 080° - 090°, and minor, but economical, concentrations parallel the remaining two structural elements of the area. One might speculate that more than one period of chrysotile formation occurred in this region but more evidence is necessary.

Geological Map of Clinton Creek Area.

Figure 1.

CHARACTERISTICS OF CHRYSOTILE VEINS

a) The fracture-filling character of many veins is shown by the cross-cutting character (Fig. 2a) where vein "a" is cut by vein "b" to produce a lateral shift in the positions of the 2 segments of vein "a".

b) Picrolite veins almost invariably truncate chrysotile veins (Fig. 2b). Some chrysotile veins are coated with picrolite that is normally thick on one side of the vein and thin or absent on the other side.

c) Where two semi-parallel veins are joined by a third veinlet or two semi-parallel veins merge, a central layer of magnetite and/or picrolite is present at the zone of merging (Fig. 2d; 2e). Several magnetite "trains" can also be present, inclined slightly relative to the vein orientation (Fig. 2f). In one case a fibre vein was found to be bordered by thin zones of magnetite (Fig. 2g).

d) There is a direct relation between quantity of fibres and intensity of fracturing. The quantity of fibre increases with increase in fracture density. Fibre length varies inversely with intensity of superposed fracturing and shearing (fig. 2h; 2i). If a zone is severely sheared (to the degree of fish scale shearing) there is very little or no fibre present (Fig. 2j). This indicates that fibre destruction is due mainly to mechanical deformation.

In these very highly sheared zones fibres survive locally. Such fibres occur on slip planes or close to slip planes and are brittle, brownish and have a multiple fibre character. The existance of pre-shearing fibre can also be proved by chrysotile-bearing massive blocks of serpentine surrounded by non-fibre-bearing, very highly sheared zones (Fig. 2k).

e) Apparent cross-cutting relationships of the veins do not serve to determine relative ages of the vein. Vein "a" cuts vein "b" at one level but vein "b" cuts vein "a" only a few feet above (Fig. 2l). In some cases two veins which appear to have a cross-cutting relationship, have a continuous fibre through both veins at their point crossing (Fig. 2m; 2n).

f) Fibres filling tension gashes seem to represent the initial stage of the growth of multi-fibre vein (Fig. 2o; 2p).

g) Figure 2q shows the relationship of the orientation of fibres with the direction of movement. Maximum stress direction is assumed to be parallel to the direction of movement, that is, parallel to vein "a". Thus, it is found that:

i) Inclination of fibre to the walls of the vein is (10°) in vein "a".

ii) Vein "b" which is sub-parallel to the force direction has an angle of 35°.

iii) The angle between fibre and wall is about 55° in vein "d", which is oriented at about a 45° angle to the force direction.

iv) Vein "c", nearly normal to the force direction has an 85° angle between wall and fibre. It yields by offset parallel to fibre rather than shearing.

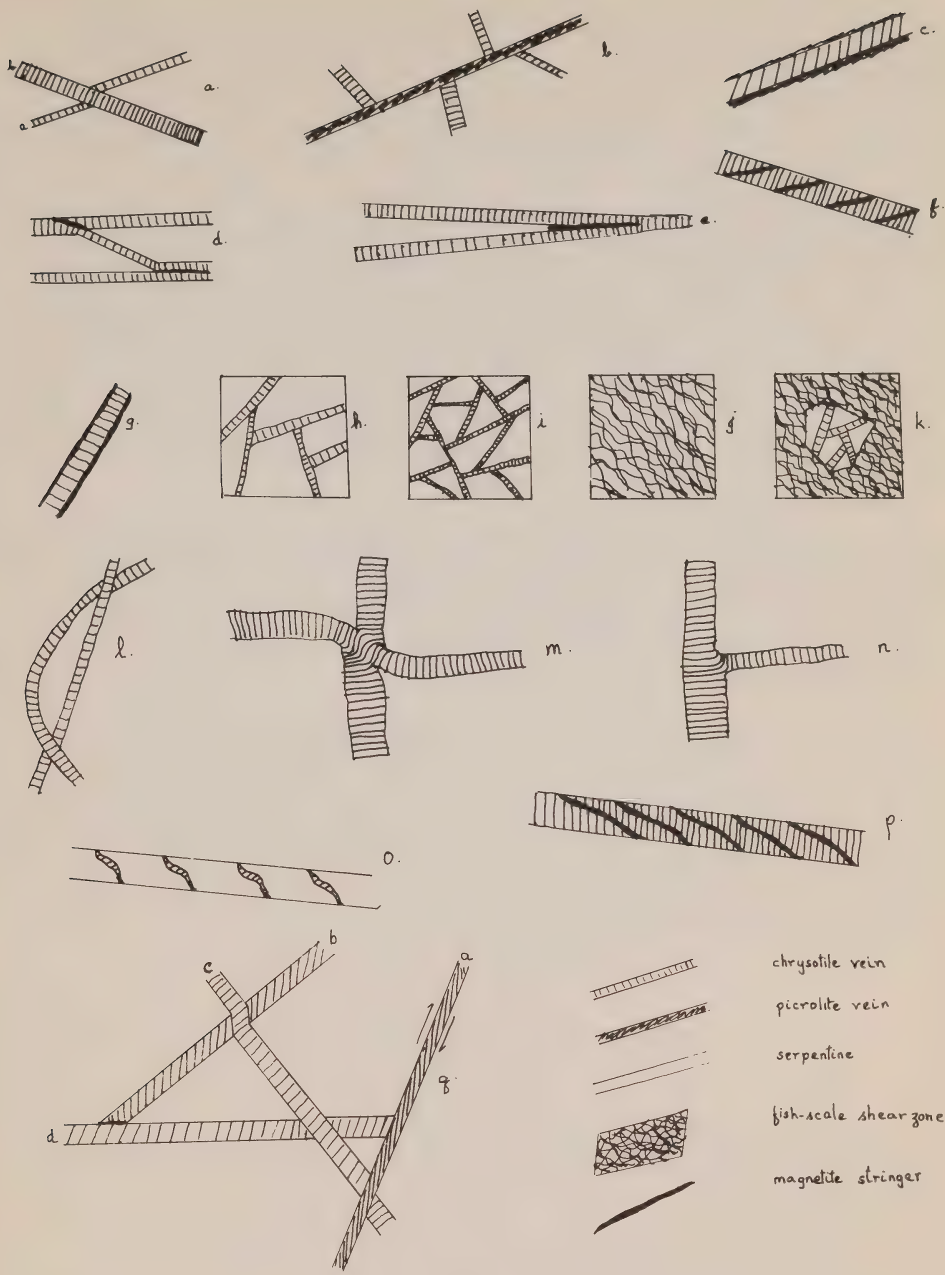

a.
b.
c.
d.
e.
f.
g.
h.
i.
j.
k.
l.
m.
n.
o.
p.
q.
chrysotile vein
picrolite vein
serpentine
fish-scale shear zone
magnetite stringer

Figure 2.

Degree of serpentinization and intensity of fracture seem to be the major controlling factors for the formation of chrysotile crystallized in both shrinkage and tectonic fractures. Tectonic fractures seem to be more important for development of most economically important fibres. Deformation associated with intermediate to high angle faulting probably gives rise to fibre formation. Reverse and thrust faulting destroyed some of the fibres and divided chrysotile into different spatial zones and different grades.

Ultramafic rocks were serpentinized, and later, under favourable circumstances chrysotile and picrolite were formed. Field evidence shows that these two minerals may also be formed one from the other.

There is a zoning of alteration minerals from centre of the main ultramafite body towards the margins. Magnesite, talc and some quartz characterize the central alteration zone of the body. The marginal alteration zone is serpentinite partly replaced by coarse-grained, dark green chlorite. Chlorite becomes paler, closer to the margin and is associated with tremolite. In some places these marginal alteration minerals penetrate a few feet into adjacent metamorphic rocks, and are found in fractures which are parallel to tranverse faults related to folds whose axes trend east-west.

Silica-carbonate alteration occurs only at the margins of some ultramafics in east-west trending normal faults. This alteration type has a rusty-brown colour due to a high content of limonite and ochre. Opal blocks in this zone are very fragile and colour ranges from orange-brown to "dirty" green. These chunks of opal are generally embedded in muddy and earthy looking groundmass of clay minerals, limonite, ochre, chips of magnesite, calcite and highly altered serpentine.

Seventy thin sections were examined to investigate the different stages of transformation from serpentine to the ultimate complete products replacement by quartz and carbonates. X-ray diffraction and electron microprobe techniques were used to identify those minerals which could not be identified by petrographic methods. A fluid inclusion study is to be carried out to examine the minimum temperature of deposition of quartz-carbonate alteration. Age of metamorphism of metamorphic rocks at the vicinity of mine will be determined by the K-Ar method. Polished-section studies will also be done to reveal the associated apaque minerals and their textural relations relative age and implications.

APPENDIX

PRINCIPAL ROCK TYPES--APPROXIMATE MODES

Serpentinite

Ultramafic bodies around Clinton Creek area are highly serpentinized (more than 90 per cent), but a few still give some indication of the original mineralogical composition.

Approximate Mode

Serpentine (antigorite)	50%
Clinopyroxene (diallage	30%
Orthopyroxene (enstatite)	18% (partially serpentinized to Bastite)
Olivine	trace
Magnetite	2%

∴ Lherzolite

Quartz Carbonate Rock

Quartz	33%
Magnesite	50%
Magnetite	3%
Hematite	10%
Periclase	2%
Calcite	2%

There are 2 generations of quartz and magnesite. Late quartz and magnesite are coarse-grained and normally found in cavities or fractures. Hematite has replaced magnetite. Calcite is a late fracture filling. Rock close to the serpentinite contact has magnesite vein pseudomorphs after chrysotile.

Quartzite

Quartz	86%
Carbonaceous matter	8%
Muscovite	5%
Calcite	1%

Quartz and carbonaceous matter are interbedded. Muscovite is parallel to the plane of layering (schistosity).

Quartz Muscovite Schist

Quartz	60%
Muscovite	25%
Calcite	4%
Magnetite	1%
Sericite	10%

Quartz is commonly recrystalized normal to the previous schistosity plane. Muscovite formed a layering against quartz, but could also be seen within quartz domain, with its elongation parallel to schistosity. Recrystallized coarse-grained quartz has negative association with muscovite within its domain.

Quartz Chlorite Schist (Andesite)

Quartz	27%
Chlorite	20%
Sericite (Muscovite)	17%
Calcite	12%
Epidote (Zoisite)	8%
Hornblende	10%
Oligoclase	3%
Biotite	3%
Magnetite	trace

Quartz-chlorite schist mainly consist of quartz, chlorite, sericite and calcite. It is derived from andesite. Some rocks still show the relicts of original minerals, such as hornblende, biotite and plagioclase. Carbonates and epidote are alteration products of plagioclase. Albitization is also pronounced. Chlorite impregnates all the original minerals.

Argillite

The term argillite includes a group of slightly metamorphosed sedimentary rocks including sandstone and limestone, in which graphitic and/or limy argillite is a major constituent.

Graphite	20%
Calcite	30%
Quartz	25%
Muscovite	3%
Sericite	2%
Pyrite	1%
Clay minerals	20%

Granitic Rocks and Associated Mineral Deposits of the Whitehorse Map-Area, Yukon Territory

by Gregg W. Morrison

Dept. of Geology
University of Western Ontario

Introduction:

This paper is a discussion of preliminary work carried out in the Whitehorse Map-Area on the age, form and composition of the granitic plutons in an effort to determine their relationships to the known mineral occurrences and to explain the apparent absence of porphyry copper deposits similar to those in the Mesozoic of British Columbia and the Lower Tertiary of the west-central Yukon. This is an interim report only, confirmation (or denial) of the ideas set out here depends on the availability of radiometric age determinations on selected granitic bodies. The work has been carried out at the University of Western Ontario with assistance from the Department of Indian Affairs and Northern Development and several mining companies working in the Whitehorse area.

General Geology:

The geology map (Fig. 3) is a modified version of the Geological Survey of Canada four mile map for the Whitehorse Area (Wheeler, 1961). The Mesozoic volcanic and sedimentary units in the eastern half of the sheet belong to the Whitehorse Trough segment of the Hinterland Belt. The igneous and metamorphic rocks in the west are part of the Yukon Crystalline Terrane.

Using the stratigraphic position of the plutons and their form, composition and rock textures as compared with dated bodies in adjacent map-areas, four major subdivisions of the Whitehorse granitic rocks have been recognized. However, the known mineral occurrences appear to be related to only two of the four subdivisions. Each subdivision and its associated mineral occurrences will now be considered in turn.

Upper Triassic - Lower Jurassic Hornblende Granodiorite:

Upper Triassic-Lower Jurassic hornblende granodiorite constitutes approximately sixty per cent of the total granitic rocks in the map-area, is the major phase of the Yukon Crystalline Terrane but also occurs as northwest elongated composite batholiths in the Whitehorse Trough. The composition of the batholiths ranges from quartz diorite to quartz monzonite (Fig. 4). Cobbles and boulders in Upper Triassic and Jurassic conglomerates have a

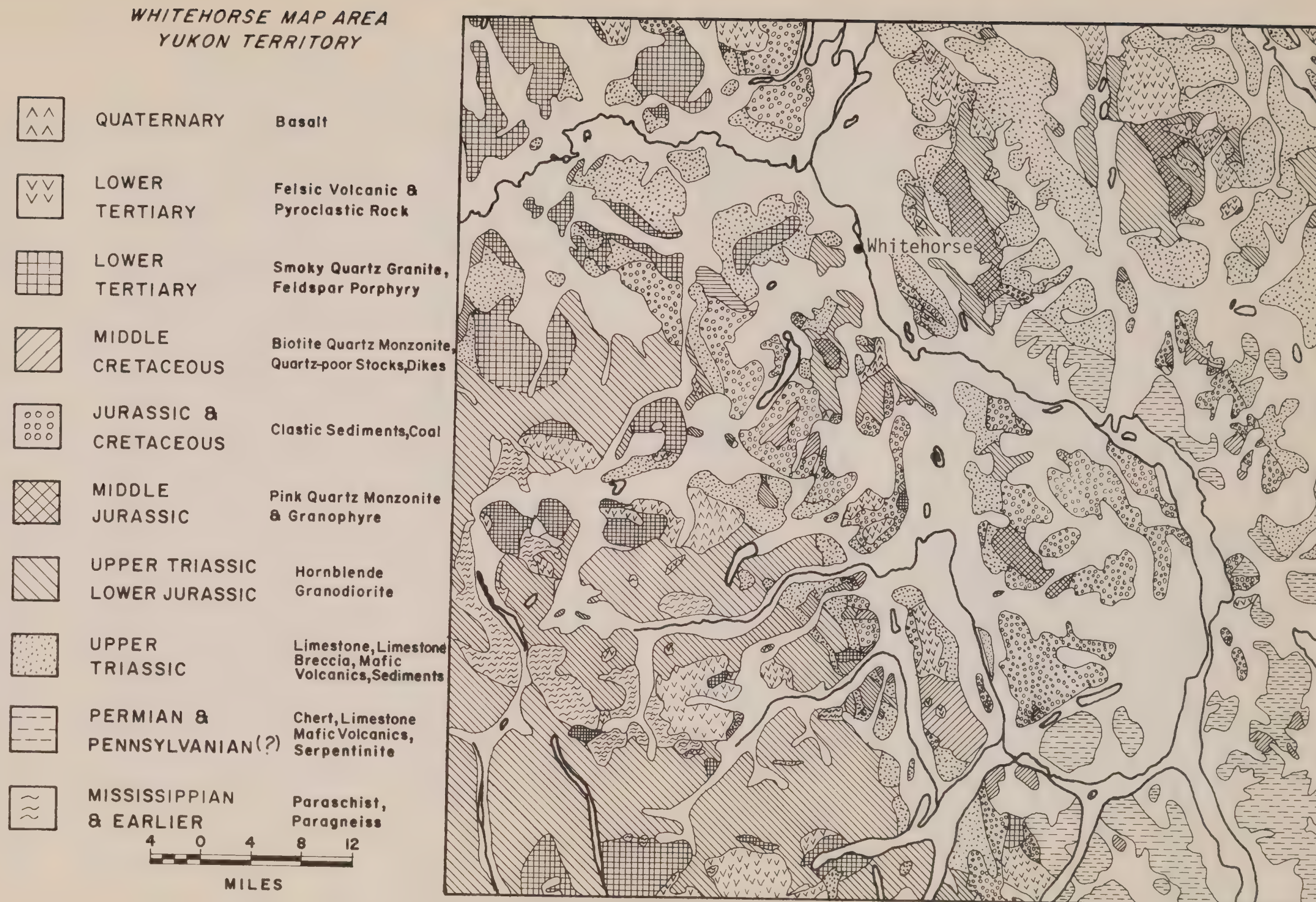

WHITEHORSE MAP AREA
YUKON TERRITORY
QUATERNARY
Basalt
LOWER TERTIARY
Felsic Volcanic & Pyroclastic Rock
LOWER TERTIARY
Smoky Quartz Granite, Feldspar Porphyry
MIDDLE CRETACEOUS
Biotite Quartz Monzonite, Quartz-poor Stocks, Dikes
JURASSIC & CRETACEOUS
Clastic Sediments, Coal
MIDDLE JURASSIC
Pink Quartz Monzonite & Granophyre
UPPER TRIASSIC LOWER JURASSIC
Hornblende Granodiorite
UPPER TRIASSIC
Limestone, Limestone Breccia, Mafic Volcanics, Sediments
PERMIAN & PENNSYLVANIAN (?)
Chert, Limestone Mafic Volcanics, Serpentinite
MISSISSIPPIAN & EARLIER
Paraschist, Paragneiss
4 0 4 8 12
MILES
Whitehorse

Figure 3.

similar range of composition to the Upper Triassic-Lower Jurassic hornblende granodiorite. However, some well-foliated quartz diorite fragments may be more comparable to mid-Triassic quartz diorites of the Tulsequah map-area in northern British Columbia (Souther, 1971). Similar rocks may also outcrop in the Whitehorse map-area. The hornblende granodiorite generally has a weak foliation due to the alignment of euhedral hornblende phenocrysts and is characterised by the presence of coarse yellow sphene crystals.

The copper-iron skarn deposits of the Whitehorse Copper Belt occur in enclaves of Upper Triassic limestone within the Upper Triassic Copper Belt Intrusion. The best mineralization often occurs in stratabound lenses within graphitic, dolomitic limestone underlain by unmineralized quartzite and sandstone. Sharp contacts between the granoriorite and the sedimentary rocks and the virtual absence of hydrothermal alteration, dykes and veins related to the granodiorite suggest the intrusion was passive and had a simple crystallization history. The intrusion may only have acted as a heat source in redistributing metals already present in the sedimentary rocks.

Mid-Jurassic Pink Quartz Monzonite:

Mid-Jurassic pink quartz monzonite and granophyre constitutes about ten per cent of the total granitic rocks in the whitehorse Map-Area. The northwest elongated plutons occur exclusively within the Whitehorse Trough as cores to Upper Triassic granodiorite batholiths. The composition of the plutons is almost entirely within the quartz monzonite field (Fig. 4) and the rock is characterised by altered zoned plagioclase phenocrysts in a pink granophyric groundmass. No mineral occurrences appear to be associated with these plutons.

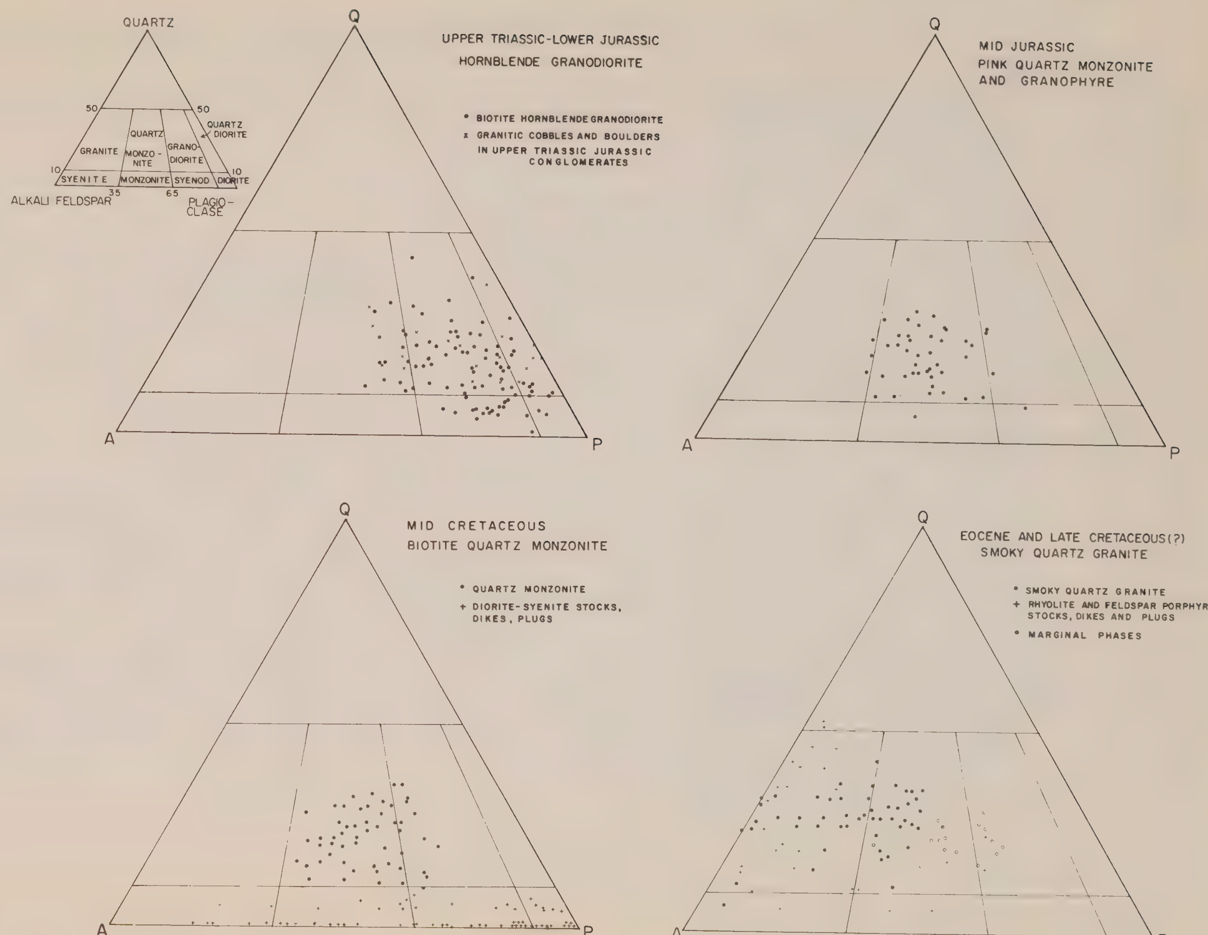
Mid-Cretaceous Biotite Quartz Monzonite:

Mid-Cretaceous biotite quartz monzonite plutons and quartz-poor stocks and dykes constitute about ten per cent of the granitic rocks in the map-area. They occur sporadically in the Whitehorse Trough and are comparable to intrusions in the Omineca Crystalline Belt to the east. The compsition of the plutons is quartz monzonite to granodiorite and the hypabyssal rocks range from diorite to syenite (Fig. 4). The quartz monzonite is generally unfoliated and is characterised by the presence of large plagioclase phenocrysts and biotite-rich inclusions. No significant mineral occurrences are associated with these intrusions.

Lower Tertiary Smoky Quartz Granites:

Lower Tertiary and possibly Upper Cretaceous granite plutons make up about twenty per cent of the granitic rocks in the map-area. They occur mainly in the Yukon Crystalline Terrane but also sporadically in the Whitehorse Trough and have affinities for the Coast Plutonic Complex. The intrusions are generally circular and associated with feldspar porphyry and rhyolite dyke swarms and felsic volcanic and pyroclastic rocks. The plutons range from granite to quartz monzonite in compsition with marginal phases transitional to granodiorite and hypabyssal rocks poor in plagioclase (Fig. 4). The rock is characterised by the presence of rounded grains and clusters of smoky quartz and by the presence of miarolitic cavities often containing quartz and fluorite.

A wide range of polymetallic sulphide occurrences appear to be related to the hypabyssal phases of the Lower Tertiary smoky quartz granite (Fig. 5). Copper-rich mineralization occurs within zones of potassic alteration in deep seated granite dykes and plugs and subvolcanic breccia zones. Felsite dykes



QUARTZ
50
50
QUARTZ DIORITE
QUARTZ
GRANITE
MONZO - NITE
GRANO- DIORITE
10
10
SYENITE
MONZONITE
SYENOD
DIORITE
35
65
ALKALI FELDSPAR
PLAGIO- CLASE
UPPER TRIASSIC-LOWER JURASSIC
HORNBLENDE GRANODIORITE
• BIOTITE HORNBLENDE GRANODIORITE
x GRANITIC COBBLES AND BOULDERS IN UPPER TRIASSIC JURASSIC CONGLOMERATES
MID JURASSIC
PINK QUARTZ MONZONITE
AND GRANOPHYRE
MID CRETACEOUS
BIOTITE QUARTZ MONZONITE
• QUARTZ MONZONITE
+ DIORITE-SYENITE STOCKS, DIKES, PLUGS
EOCENE AND LATE CRETACEOUS(?)
SMOKY QUARTZ GRANITE
• SMOKY QUARTZ GRANITE
+ RHYOLITE AND FELDSPAR PORPHYRY STOCKS, DIKES AND PLUGS
• MARGINAL PHASES
Q
A
P

Figure 4.

and plugs often contain disseminated molybdenite and are surrounded by zones of phyllic to propylitic alteration within which quartz veins and disseminations contain base and precious metals. The base metals generally appear closest to the intrusion and precious metals with antimony further away.

Conclusions:

It has been shown that the stratigraphic, compsitional and textural data are sufficient to easily distinguish the four major granitic rock types. This is an essential first step in exploration for intrusion-related mineral occurrences in this area, since the known mineral occurrences are associated with only two of the four granitic rock types. The copper-iron skarn deposits in Upper Triassic banded limestones are associated with Upper Triassic granodiorite which may only have acted as a heat source for metal concentration. The nature of the Upper Triassic granodiorite distingushes it from porphyry copper-bearing granitic rocks of similar age in British Columbia. The Upper Triassic granodiorite batholiths in the Yukon Crystalline Terrane are not a good prospect for porphyry-type mineralization. The polymetallic nature and the alteration associated with the Lower Tertiary subvolcanic rocks suggest they have good potential for porphyry copper mineralization of the Casino type (Tempelman-Kluit, 1974; Godwin, 1975).

DIAGRAMMATIC ALTERATION AND METAL ZONATION
IN AND ADJACENT TO TERTIARY SUBVOLCANIC ROCKS

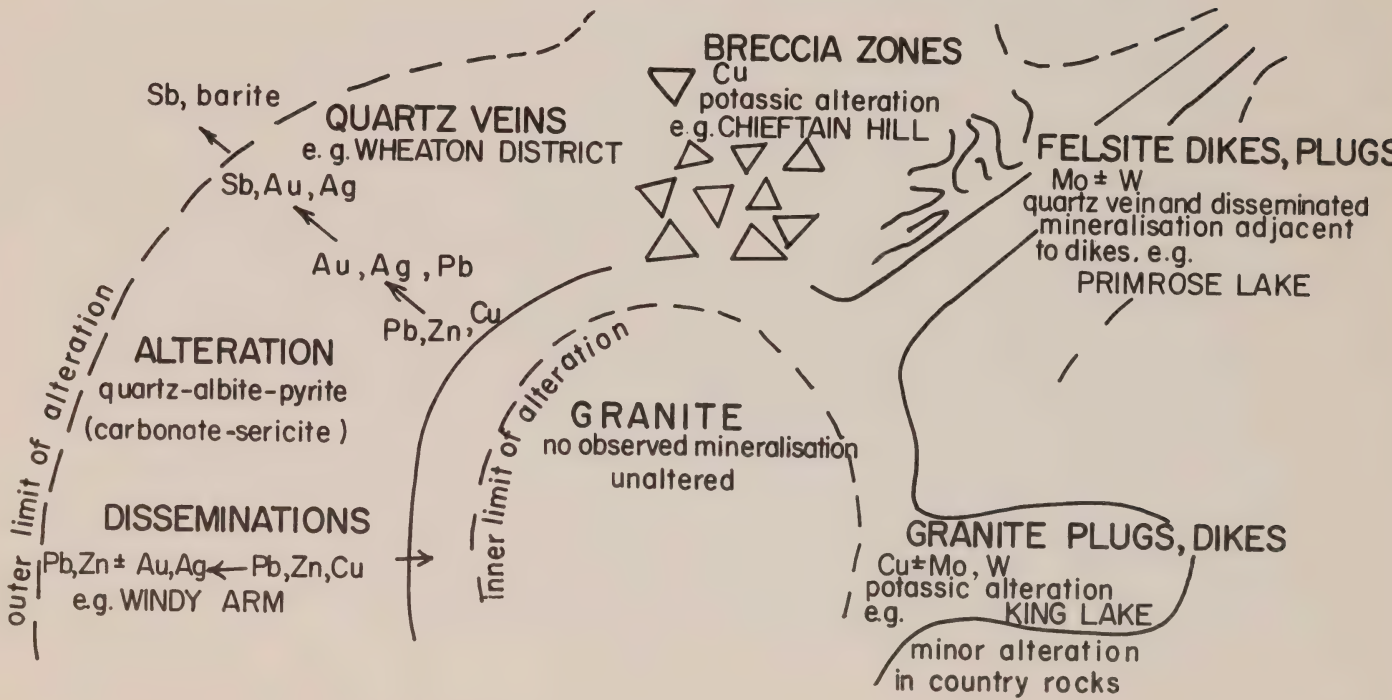


Figure 5.

MAYO MINING DISTRICT

* - Properties visited by J.A. Morin unless otherwise indicated.

SON, PIK
Norex Development Limited

Antimony, Silver, Gold
105 M 11
(63°35'N, 135°12'W)

Reference: Bostock (1947); Sinclair and Gilbert (1975).

Claims: PIK 1-6; SON 7-26

Location and Access:

The property is located about 22 miles east of Mayo and is easily reached by helicopter from that point. In addition, a tote road extends from Mayo to the property along the valley of the Stewart River, but the road is sometimes impassable by wheeled vehicles.

History:

The SON claims were staked in November 1970 following the discovery of a large boulder of stibnite in 4 Mile Creek. The PIK claims were staked in October, 1971. Intermittent trenching and stripping have been carried out on the main showing from 1971 to the present.

Description:

The property is underlain by flaggy to blocky weathering massive pebbly quartzite with interbedded schist and phyllite. (Unit 6, Bostock, 1947) belonging to the Yukon Group of Precambrian age or younger. To the northeast, these rocks are underlain by interbedded quartz-mica schist and schistose quartzite (Unit 5, Bostock, 1947) also belonging to the Yukon Group.

The showing occurs along a 15 foot high rock face at the base of a steeply dipping overburden covered slope on the north side of 4 Mile Creek. It consists of a vein of massive fine- to coarse-grained stibnite with a maximum apparent thickness of 12 inches and a length of about 7 feet. The vein pinches out to the east as a thin yellow oxidized seam dipping about 60° into the hillside. In addition, some boulders of massive stibnite occur along the top of the bedrock outcrop below the overburden. These boulders may have been derived in situ.

The geology of the immediate showing area is complex and consists of isoclinally folded interbedded phyllite and quartzite. The quartzite exhibits well developed fracture cleavage which is parallel to the bedding and is intersected at high angles by schistosity. Both the quartzite and phyllite are transected by thin veinlets of white quartz. The presently exposed mineralization appears to be on the south dipping limbs of a minor synform and is probably an extension of the original much longer vein situated at the foot of the rock face. This vein is now covered by fill but is reported to 100 feet long (Sinclair and Gilbert, 1975). Axes of minor folds on the outcrop vary from 215 to 250 degrees and plunge 30 degrees. Along the showing outcrop a vertical fault trending 085 degrees is exposed, which appears to terminate the northern extension of the vein. However, the mineralized boulders along the top of the outcrop may be the upthrown extension of the showing vein.

Current Work and Results:

During 1975, work on the property included blasting, stripping and a soil geochemical survey. A bench about 30 by 120 feet was bulldozed at the base of the hill adjacent to the showing and systematic shorthole drilling and blasting was performed at the rock face. The blasting resulted in the removal of about 6 feet of the face and the mineralized vein was found to decrease considerably in length down to about 7 feet.

Along the hill slope on the north side of the creek a trail was bulldozed which ends nearby over the showing area, about 50 feet higher up the hill. Attempts were made to bulldoze through the overburden to reach the top of the bedrock behind the showing. However, these attempts have been unsuccessful to date.

A soil geochemical survey for antimony was conducted along the hill slope on the north side of the creek. Samples were collected at 100 foot intervals along four 600 foot long lines spaced 200 feet apart. In addition, samples were also collected along two lines at 50 foot intervals across the grid lines.

Assays on chip sampled material obtained during the summer ranged from 2 to 2 1/2 per cent antimony over a vein length of 10 feet and 40 to 50 per cent antimony over a width of 18 inches.

United Keno Hill Mines Limited

Silver, Lead, Zinc, Cadmium
105 M 13, 14
(about 63°55'N, 135°29'W)

Selected References: Boyle (1957; 1965; 1968); Green and McTaggart (1960); Green (1966, pp. 10-17) Gleeson (1966; 1967); Findlay (1967, pp. 18-21; 1969a, pp. 20-24; 1969b, pp. 10-12); Tempelman-Kluit (1970); Craig and Laporte (1972, pp. 11-13); Craig and Milner (1975, pp. 28-29); Sinclair and Gilbert (1975, pp. 9-11); Sinclair *et al* (1975, pp. 10-12).

Claims: 493 claims

Location and Access:

The properties situated mainly on Keno Hill and Galena Hill, are readily accessible by an all-weather road from Mayo, 32 miles to the south. Ore concentrates are trucked 277 miles to Whitehorse, then transferred to the White Pass and Yukon Route and shipped by rail to Skagway.

History:

Silver-bearing galena was first discovered on Galena Creek in 1906 and small tonnages of high-grade ore were shipped from 1913 to 1919. Following the discovery of the No. 9 vein by Louis Beauvette in 1919, which resulted in a stampede, numerous important prospects were located. Since then there has been almost continuous production from veins in the area, except for the period 1942 to 1946.

Description:

The area is underlain by graphitic and sericitic schist, phyllite and quartzite which have been divided into three units: a lower schist, a central quartzite, and an upper schist (Units 1, 2 and 3, Boyle, 1965). Formerly considered to be part of the Precambrian Yukon Group metasediments, the lower schist and central quartzite are now considered to be Jurassic and Lower Cretaceous respectively, based on stratigraphic correlations (Tempelman-Kluit, 1970). The age of the upper schist is uncertain. Metadiorite and metagabbro, locally referred to as "greenstone", occurs as conformable lenses and sills in the lower schist and central quartzite. Granitic stocks of Cretaceous age outcrop northwest and southeast of Galena and Keno Hills and related quartz-feldspar porphyry dikes are present locally throughout the area.

The metasediments form the southern limb of a large, open anticline and dip gently to the southeast. There are two systems of steeply-dipping faults, one trending northeast and the other northwest.

The ore deposits consist of veins developed in dilatant zones in northeast-trending faults cutting thick-bedded quartzite and greenstone. The principal ore minerals are galena, sphalerite, freibergite and chalcopyrite. Gangue minerals include siderite and pyrite.

Current Work and Results:

In 1975, United Keno Hill Mines Limited operated six mines in the Keno-Galena Hills area with a total production of 90,860 tons of ore averaging 35.0 ounces per ton silver, 4.0 per cent lead and 1.2 per cent zinc. Production was mainly from the Husky Mine, followed by the No Cash and Keno Mines. The Elsa, Townsite and Dixie Mines produced lesser amounts of ore. Development work at the Husky included 511 feet of drifting on the third level, of which 160 feet was in ore. In addition, 356 feet of cross-cutting were completed on the third level to provide diamond drill stations for exploration below the third level. Three minor ore zones were found beneath the bottom of the shaft and studies were underway at the end of the year to determine the feasibility of mining these zones. At the No Cash Mine, development work consisted of 181 feet of cross-cutting and 1,386 feet of drifting and sub-drifting which developed 48 feet of ore. Underground development at the Keno Mine, including the Shamrock Project, consisted of 184 feet of cross-cutting and 662 feet of drifting, of which 271 feet were in ore. Several favourable structures were indicated by overburden drilling but the targets are too deep to be explored from surface and underground drifting is required to delineate the targets. At the Elsa Mine, development work consisted of 364 feet of subdrifting on the 500 level, 143 feet of which developed ore. At the end of the year, raising was underway to test a high-grade intersection found above the 200-foot level by overburden drilling. Although some 244 feet of cross-cutting and 206 feet of drifting were completed at the Townsite, this mine was closed in 1975 because of the low grade of the ore. At the Dixie Mine, development work totalled 190 feet of cross-cutting and 432 feet of drifting. Although no ore was developed, the mine is considered to have potential.

United Keno continued its program of overburden drilling on Galena, Keno and Sourdough Hills. In addition to the small ore zone in the Elsa 200 area, the drilling outlined four areas which warrant further work. Surface exploration was also carried out on the KPO-LEO claims optioned from Cima Resources Limited.

The following summary of operations in 1973, 1974 and 1975 is taken from annual reports of the company:

	1975	1974	1973
Tons Milled	90,860	93,232	94,819
Daily Average (tons)	249	255.4	259.8
Mill Heads:			
Silver (oz/ton)	34.96	37.93	34.99
Lead (%)	4.03	4.22	4.04
Zinc (%)	1.15	1.15	0.92
Metal Production:			
Silver (oz/ton)	2,917,920	3,237,205	3,134,828
Lead (lb)	6,407,368	6,737,719	7,262,400
Zinc (lb)	620,763	545,357	1,345,062
Cadmium (lb)	8,758	7,330	17,944
Metal Sales:	$15,696,435	$17,480,540	$11,614,473
Ore Reserves (tons)	121,737	105,632	84,500
Silver (oz/tons)	39.3	44.0	47.4
Lead (%)	4.7	4.9	5.8
Zinc (%)	1.1	1.2	1.5

ROSS
Rio Plata Silver Mines Limited

105 M 14
(63°54'N, 135°26'W)

Reference: Sinclair and Gilbert (1975).

Claim: ROSS

Location and Access:

The claim is located 1.4 miles west of Keno City and access is gained by the old highway from Keno City to Calumet which crosses the upper part of the claim.

History:

The claim was staked in October 1973 and is part of the AZTEC group of claims and is bounded on the northeast by the CALIENTE claim and on the southeast by the MEXICO. In 1973, a geochemical soil sampling program was conducted over the property and several anomalous areas were determined.

Description:

The claim is underlain by the Cretaceous Central Quartzite Formation which trends east-west and dips gently to the south. A major cross-fault strikes easterly across the ROSS claim south of Hinton Creek.

Current Work and Results:

During summer 1975, a geochemical soil sampling program for Pb was conducted over the ROSS claim to further delineate anomalous areas found in 1973. Forty-five samples were collected and anomalously high values were determined in the area of Hinton Creek.

FORMO | Silver, Lead, Zinc
Rio Plata Silver Mines Limited | 105 M 14
(63°56'N, 135°23'W)

References: Green and Godwin (1963, p. 10); Boyle (1965, pp. 67-68); Sinclair and Gilbert (1975, p. 12); Sinclair *et al* (1975, p. 12).

Claims: PAPOOSE; TYEE; PREMIER; SPRUCE; CHEECHAKO; ROCKET; TILLICUM; DOROTHY; TAGISH; SKOOKUM; BIRCH; BRA; SOMETHING (Fr); WIMPY (Fr)

Location and Access:

The property is situated on the north slope of Galena Hill, nearly five miles northeast of Elsa. Access is by the Keno-Elsa Road.

History:

The history of the property to 1974 is described in the 1974 M.I.R. (Sinclair *et al*, 1975).

Description:

The property is underlain by graphitic, quartz-sericite schist of the Lower Schist Formation (Sinclair *et al*, 1975).

Current Work and Results:

During July 1975, nine geochemical soil samples for Pb were collected over the SOMETHING (Fr) claim to trace a vein fault. However, no anomalies were determined.

HEART* | 105 M 15
G. McLeod | (63°59.5'N, 134°53'W)

Reference: Boyle (1965).

Claims: HEART 1-8

Location and Access:

The property is located about 42 miles northeast of Mayo on the southwest side of Mount Patterson and is accessible by helicopter.

History:

The claims were staked in September 1975. Early investigation of the property with a total count scintillometer discerned several anomalous zones of radioactivity.

Description:

The property is underlain by northerly trending rocks of Boyle's Unit 1 which dip gently to the east. They consist of interbedded massive dark grey amphibolite, biotite hornblende schist, phyllitic staurolite sericite schist and thinly layered micaceous sandstone.

Current Work and Results:

The property was examined in June 1976 with a gamma ray spectrometer (Exploranium DISA 400-A). Over eighty measurements were taken and representative values are presented below:

	Total Count/sec	K	U	Th
Amphibolite	130	2	2	1
Biotite-hornblende schist	400	9	2	2
Phyllitic staurolite schist	650	12	4	2
Sericite schist	920	20	4	3
Sandstone	460	12	3	2

Inspection of the data shows that areas which recorded high scintillometer total counts in the earlier survey correspond with potassium rich zones within units of sericite staurolite schist. The potassium rich zones have only background values in uranium and thorium.

G. McLeod, prospector, reported the presence of narrow veins of pitchblende (?) up to 15 feet long and varying from 3 to 7 feet in width. The veins were in quartzite and were reported to consist of colloform masses of a brick red metallic mineral with pyramidally terminated crystal, one sample of which may have caused a skin rash on Mr. McLeod. However, no samples exist from the occurrence and its exact location has not been redetermined.

Mount Armstrong*
Union Carbide Canada Mining Limited

Tungsten, Copper
105 N 3
(63°15'N, 133°20'W)

Reference: Blusson (1974a).

Claims: TONGUE 1-32, CHEEK 1-16, TONSIL 1-14, NOSTRIL 1-2

Location and Access:

The property is located on Mount Armstrong, 65 miles due north of Faro. Access is by float equipped fixed wing aircraft to Russell Lake (on Russell Creek), about 80 miles east-southeast of Mayo and thence the remaining 8 miles by helicopter to the property. In 1975 access to Russell Lake was provided by float plane from Little Salmon Lake, 85 miles to the southwest and from Watson Lake.

History:

The claims were staked in 1974 and 1975 following a regional exploration reconnaissance, which led to the discovery of relatively high-grade float mineralization in talus near the main showing.

Description:

The geology consists of an elliptical plug of medium grained, grey quartz monzonite intrusive into sediments of Hadrynian age. Near the intrusion, the regional trend is locally deformed into a series of synclinal warps. Three siliceous marble units contain the mineralization with the main showing in the middle unit.

The main showing consists of foliated medium grained quartz-pyrrhotite-chalcopyrite-scheelite-skarn situated at the contact of the quartz monzonite plug with siliceous and limy sedimentary rocks. Other mineralization on the property includes a few sulphide skarn units about two feet thick, localized near and along contacts with the quartz monzonite. Nearby, similar thin beds of skarn are found associated with faults.

Current Work and Results:

In 1975, the claims were geologically mapped at a scale of 1 inch = 400 feet, a geochemical soil sampling survey for Cu, W, and Zn and geophysical surveys were also carried out.

Five diamond drill holes were drilled (BQ core) for a total of 4,866 feet and one Winkie diamond drill hole (AX core) for 103 feet. Results were discouraging and no further work is planned.

JASON — 105 0 1
Ogilvie Joint Venture — (63°09'N, 130°15'W)

Reference: Blusson (1974a).

Claims: JASON 1-44

Location and access:

The claims are located about 10 miles southwest of Macmillan Pass, about 130 miles east of Ross River along the North Canol Road.

History:

The claims were staked in August 1974.

Description:

The property is underlain by argillite of the Ordovician-Silurian Road River Formation, which is overlain by argillite, conglomerate, black shale and siltstone of Devonian (?) age. A horizon consisting of bedded and spotty barite within the black shale unit is thought to occur at the same stratigraphic horizon as on the adjacent TOM property to the east. The rocks have been folded into easterly plunging anticlines and synclines which trend in a southeast direction. The black shale exhibits a marked increase in thickness over a short distance within the claim group which may be related to a synsedimentary fault west of the claim group.

Current Work and Results:

Geological mapping was carried out on the property during June and July 1975 at a scale of 1 inch = 1,000 feet. In addition, geochemical (Pb, Zn, Ba) and gravity surveys were performed on two grids having lines spaced 1,500 feet apart. The soil samples and gravity readings were taken at 100 foot intervals.

Pb-Zn-Ba anomalies coincident with a gravity high led to exploratory diamond drilling in October 1975. Seven holes were drilled (BQ core) for a total of 2,100 feet. The stratigraphy encountered was as expected and dditional drilling along with geochemical and geophysical surveys were recommended for 1976 by the company geologist.

TEA
Welcome North Mines Limited

Barite
105 0 2
(63°02'N, 130°37'W)

Reference: Blusson (1975a, 1971).

Claims: TEA 1-100

Location and Access:

The property is located about 17 miles southwest of the TOM property and 5 miles north of the Canol Road. Access to the property is by helicopter.

History:

The claims were recorded in July 1975.

Description:

The property is underlain by the Besa River Formation of Upper Devonian age. Bedded barite occurs within a 700 foot thick stratigraphic sequence of Lower Besa River shale. The barite is grey to black, fine grained to nodular, and generally has a low silica content. Other occurrences of barite have been found on the property and in these the barite is mainly nodular or concretionary. Within the main barite horizon, initial sampling has indicated potential zones of direct shipping grade material.

Current Work and Results:

During the summer of 1975, geological mapping of the claim group at scales of 1 inch = 1/2 mile and 1 inch = 1 mile and a geochemical soil sampling program for Pb, Zn were undertaken. Bulldozer trenching and bulk sampling of the barite occurrences was completed late in the season.

CATHY, LORRAINE, CHAS, KAM,
LES, WALT, FAT, CITY
Baroid of Canada, Limited

Barite
105 0 7
(63°16'N, 130°34'W-39'W)

Reference: Blusson (1974a, 1971).

Claims: CATHY 1-6, LORRAINE 1-6. CHAS, KAM 1-2 Fr, LES, WALT, FAT and CITY

Location and Access:

The property is located about 105 miles northeast of Ross River and 12 miles west of the Yukon-NWT border. During 1975, access was provided by float plane to Keele Lake where a base camp was situated and from there by helicopter the remaining 15 miles south to the property.

History:

The CATHY and LORRAINE claims were staked in February 1975, with the remaining claims staked in July 1975.

Description:

The property is underlain by the Besa River Formation (Blusson, 1971) of Upper Devonian age which consists of black, noncalcareous shale interbedded with siltstone, limestone, pebble conglomerate and barite.

Current Work and Results:

Preliminary geological and geochemical work was conducted during 1975.

KEN
Canada Tungsten Mining Corporation Limited

Tungsten
105 0 8
(63°15'N, 130°05'W)

References: Blusson (1974a); Sinclair et al (1975).

Claims: KEN 1-30

Location and Access:

The KEN claims are located roughly four miles northwest of Macmillan Pass on the Yukon-N.W.T. border. Access is by helicopter from the Canol Road.

History:

The KEN 1-30 claims were staked in May 1973 and subsequently acquired by Tyee Lake Resources Limited and Titan-Polaris Mines Limited who conducted geological mapping, and soil and silt sampling in 1973. Several skarn zones were outlined and some associated scheelite was noted. In 1974, the property was optioned to Canada Tungsten Mining Corporation Limited who conducted a combined Turair electromagnetic and magnetic survey which outlined a number of coincident electromagnetic and magnetic anomalies.

Description:

The property is underlain by black to grey argillite, limestone and impure limestone which strike 075° and dip gently to nearly vertical to the south. Immediately overlying the Proterozoic-Paleozoic unconformity is a unit of thinly bedded grey, green, brown calc-silicate-bearing rocks along with limestone conglomerate and minor banded limestone. Associated with these rocks is a minor pyrrhotite-garnet-diopside skarn with minor scheelite and chalcopyrite.

Current Work and Results:

In 1975, the property was geologically mapped at a scale of 1 inch = 1,000 feet. In addition, some bedrock and soil geochemical sampling was conducted over two claims (Y 69355 and Y 69356). Two diamond drill holes (AQ core) were drilled on Y 69364 and Y 69363 for a total of 1,861 feet. No mineralization other than pyrite, pyrrhotite, chalcopyrite (small amount) and carbonate was found in any of the core.

ODD
McIntyre Mines Limited

Zinc, Lead
105 0 13
(63°51'N, 131°54'W)

Reference: Blusson (1974a).

Claims: ODD 1-90

Location and Access:

The property is located about 125 miles east of Mayo and is accessible by float plane from Mayo to a small unnamed lake and from there four miles northwest to the property by helicopter.

History:

The claims were staked in September 1974 as a result of reconnaissance prospecting.

Description:

The claims are underlain by carbonate and clastic rocks of the Hadrynian 'Grit Unit' which are deformed into broad, open north-south-trending folds. The local stratigraphy is similar to that of the TOM group, 24 miles to the north and specifically consists of the following from bottom to top: lower shale unit (very thick, no major lithology change to 1,500 feet); lower arenaceous unit (120 to 250 feet); grey weathering micrite unit (700 feet); upper thin bedded limy clastics (330 to 600 feet); upper arenaceous unit (200 to 450 feet) and the upper varicoloured shale unit (very thick, no top seen on claims).

Most of the mineralized lead-zinc showings are associated with zebra dolomite breccia zones situated within the grey micrite unit. The mineralization occurs as pods of massive coarse-grained galena and green sphalerite associated with coarse-grained white dolospar in zebra breccia. A typical assay of the massive mineralization yielded 8.00% Pb, 28.00% Zn and 0.058 oz Ag/ton over a trenched sample interval of 11 feet. Another type of mineralization is cross-cutting fractures of sphalerite and galena in unaltered micrite close to showings of massive mineralization. An eight foot diamond drill hole intersection of this type of mineralization gave the following assay: 1.84% Pb, 4.00% Zn 0.06 oz Ag/ton.

Current Work and Results:

During summer 1975, the claim group was geologically mapped at a scale of 1 inch = 1,000 feet and locally at 1 inch = 200 feet. A geochemical soil survey for Pb, Zn, Ag, Cd was also conducted. Over 750 soil samples were collected at 200 foot intervals along lines spaced 200 feet apart on one grid and 400 feet on the other. Several anomalies determined by the survey correlated with occurrences of lead-zinc mineralization. Several trenches were cut across the mineralized pods and limited short hole diamond drilling (EXT core) resulted in four holes with a total footage of 148 feet.

TOM, MOM*
McIntyre Mines Limited

Zinc, Lead
106 B 4
(64°08'N, 131°54'W)

Reference: Blusson (1974a).

Claims: TOM 1-112; MOM 1-64

Location and Access:

The claims are located about 135 miles northeast of Mayo, and about 12 miles south of Bonnet Plume Lake. Access to the property is provided by float plane to Bonnet Plume Lake and the remaining distance by helicopter.

History:

The claims were staked in August 1974 as a result of reconnaissance prospecting.

Description:

The property is underlain by isoclinally folded limestone, shale, dolomite and quartzite of the Hadrynian 'Grit Unit'. Specifically in ascending order the following units are represented: orange weathering carbonate unit (approximately 780 feet thick); lower shale unit (very thick, no bottom seen and encloses orange carbonate unit); lower arenaceous unit (discontinuous lenses); grey weathering micrite unit (900 to 1,200 feet thick); upper arenaceous unit (250 to 375 feet thick, depending on shale interbeds); upper varicoloured shale unit (very thick, no top seen).

All lead-zinc showings are contained within the upper portion of the grey micrite unit. They are associated with breccia pods in large discontinuous areas of zebra dolomite, which occur at a common stratigraphic position close to the contact between the grey micrite and upper arenaceous units. The main showing (J-35) consists of coarse grained galena and sphalerite with white dolospar in a pod of zebra breccia. Sphalerite ranges in colour from dark green through yellow to red and a 33 foot assay interval in a trench gave about 25% Pb-Zn, with Zn values from 15 to 20% and Pb values quite erratic.

Current Work and Results:

The property has been geologically mapped at a scale of one inch = 1,000 feet, with several portions at much larger scales, reflecting the complex fold and dolomitization structures. Geochemical soil surveys for Pb, Zn, Cd and Ag were conducted over various parts of the property with about 820 samples collected from five grid areas. On the large grids, samples were taken at 400 foot intervals on lines 200 feet apart.

The geochemical anomalies were found to be closely associated with the numerous small Pb-Zn showings. Lead anomalies were usually found to coincide with primary bedrock mineralization whereas zinc anomalies with no associated high lead values were commonly observed to be hydromorphic when prospected in detail.

Limited trenching was also undertaken on several of the showings. Six long diamond drill holes (BQ core) for a total footage of 2,955 feet, and 22 short holes (EXT core) for a total footage of 1,068.5 feet were completed.

BONNET PLUME RIVER AREA, 106 C

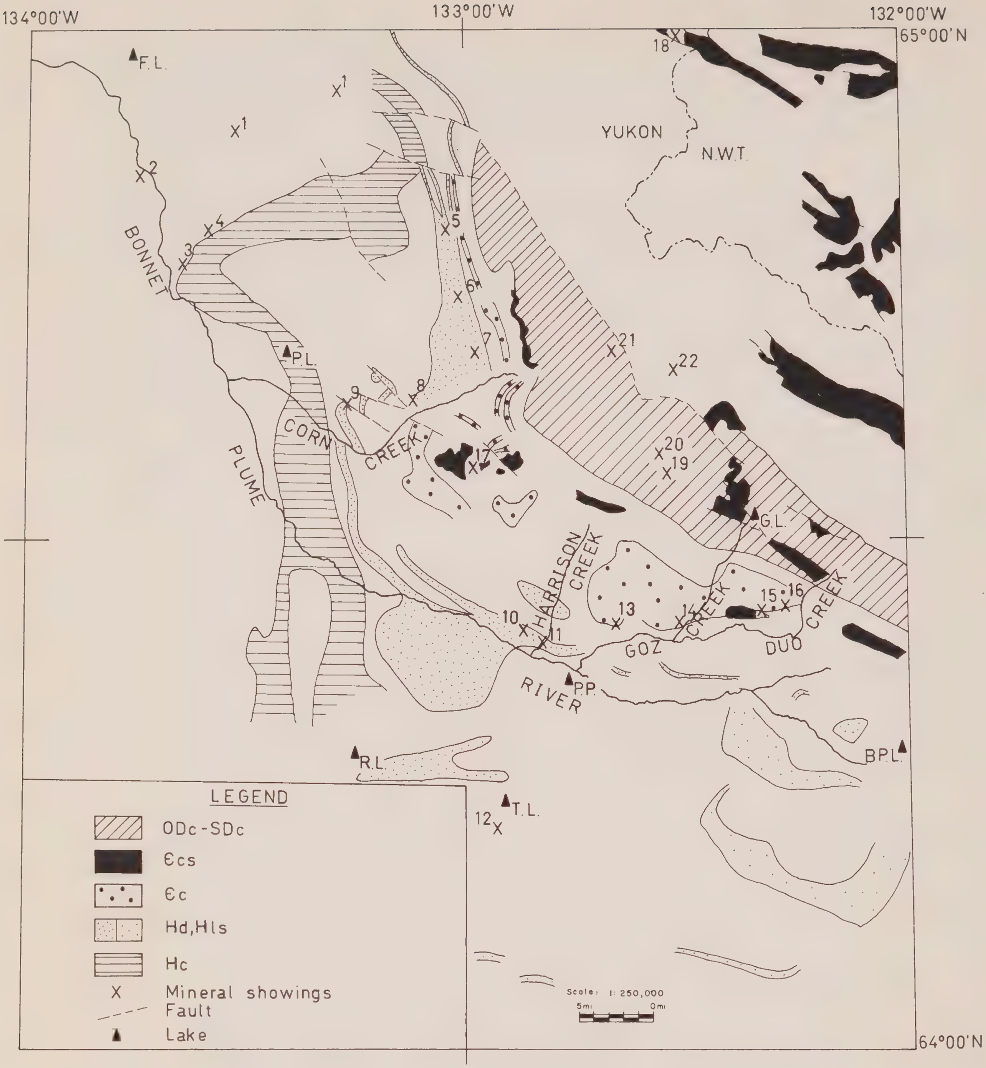
Location and Access:

The Bonnet Plume River area is located about 110 miles northeast of Mayo. Access is usually provided by fixed wing float or ski-equipped aircraft to lakes and from there by helciopter to the properties. However, a relative dearth of lakes exists and the following summarizes the salient points of each.

In the northern part of the area, mainly three lakes have been used for access: Margaret Lake, Kiwi Lake and Fairchild Lake. Margaret Lake (65°20'N, 134°30'W) is about 130 miles north of Mayo, north-south-trending and lies at an elevation of 1,605 feet above sea level. It is a large lake (2.5 by 0.5 miles) and has been used by several companies, most of whom have camped on the southern shores. Kiwi Lake (65°13'N, 134°37'W) is a local name for a small lake, (1.0 by 0.3 miles) about 9 miles south of Margaret Lake. It has been used as a base camp for mining exploration companies (Archer-Cathro) but has been noted for rather large differences between fall and spring water levels. In 1975, the spring ice level was 15 feet higher than the fall water level. Fairchild Lake (64°59'N, 133°46'W) is located about 32 miles southeast of Margaret Lake (see accompanying diagram). It is a large (2.0 by 0.5 miles) north-south trending lake and has been used as a base camp by exploration companies (Cyprus Anvil).

In the central part of the area, Pinguicula Lake (64°41'N, 133°24'W) is the main lake used by companies for access to properties in the Corn Creek area. The lake trends northwest, is 2.0 by 0.3 miles in size and is located about 105 miles northeast of Mayo. Camps have been maintained on the north-east shore, notably by Cominco. In the eastern part of the area, Goz Lake (64°32'N, 132°20'W) has been used occasionally by companies for access to properties in the Goz Creek area. The lake is small and consists of two small lakes, each 0.5 by 0.25 miles in size, connected by a creek and lies at an elevation of about 4,000 feet above sea level.

Several lakes occur in the southern part of the area: Porter Puddle, Rackla Lake, Tara Lake and Bonnet Plume Lake. Porter Puddle (64°22'N, 132°47'W) is a small lake (0.5 by 0.25 miles) with several lobate extensions that lies in the valley of the Bonnet Plume River. It is about 110 miles northeast of Mayo and is characterized by large fluctuations between spring and fall levels. In September 1975, the lake was considered to be too shallow for landing by Turbo-Beaver and Porter Pilatus aircraft. The comparative ease with which Porter Pilatus STOL aircraft can take off from the lake was the main reason for coining the local name 'Porter Puddle' for the lake. The south shore of Porter Puddle has been used as a camping and storage spot by many companies. Rackla Lake (64°18'N, 133°14'W) is located about 15 miles southwest of Porter Puddle. It is a small lake, 1.0 by 0.3 miles, and trends east-west. Tara Lake (64°15'N, 132°40'W) is a small lake about 9 miles south of Porter Puddle, just east of Nadaleen Mountain. Its name is local and was derived from the TARA claim group and it is 0.5 by 0.2 miles in size with a north-south trend. Bonnet Plume Lake (64°18'N, 132°00'W) lies at the head of the Bonnet Plume River, about 23 miles east of Porter Puddle. It is a large lake (4.0 by 0.4 miles) and trends in a northeast direction. Camps have been located on the north shore, adjacent to the outpost cabin of a game outfitter.



134°00'W
133°00'W
132°00'W
65°00'N
64°00'N
F.L.
YUKON
N.W.T.
BONNET
PLUME
CORN
CREEK
P.L.
HARRISON
CREEK
GOZ
CREEK
DUO
CREEK
RIVER
P.P.
G.L.
R.L.
T.L.
BPL.
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LEGEND
ODc-SDc
Ecs
Ec
Hd,Hls
Hc
Mineral showings
Fault
Lake
Scale: 1:250,000
5mi
0mi

Property Aquisition and Evaluation:

Properties in the area were generally acquired by one of the following methods:

1) Reconnaissance geochemical stream sediment survey, usually for Cu, Pb, Ag and follow up prospecting and/or staking over anomalies: e.g. DOC, DTG, TARA.
2) Grassroots prospecting in rock units assessed as 'geologically favourable', e.g. BOB (Cominco), Goz Creek (Barrier Reef).
3) Blanket staking of rock units assessed as 'geologically favourable' e.g. PING, BOB *et al* (Great Plains), CYR *et al* (Cypress, Brinex).

Following the acquisition of ground, the properties were prospected in detail, geologically mapped and/or subjected to a geochemical soil survey. In several cases, induced polarization surveys were also conducted. Where mineralization was visible at the surface, trenches were usually cut across the showings.

Because of the abundant outcrop exposure, many properties received no further work after preliminary surface evaluation. However, several properties received further evaluation by diamond drilling and these include the DF, CYR *et al*, Goz Creek, PING, TARA, FUN, DEA and BOB *et al*.

Geology:

The Bonnet Plume River area is made up of sedimentary rocks ranging in age from Helikian to Triassic (Blusson, 1974a, b). In general, the units trend northwesterly and dip to the northeast. Faults are common and have a dominant northwest trend with a minor north-south trend, and in many places, the stratigraphic sequence is much complicated by their presence.

The area is situated at the northeastern margin of the Selwyn Basin and was represented by the Bonnet Plume High during late Proterozoic and early Paleozoic time (Lenz, 1972). Shallow water platform carbonates formed on the High, and lithofacies to the northeast and southwest consist of shallow water sandstone and deep water shale respectively. In addition, the eastern and probably the western sides of the High were the site of small reef developments. It is within these carbonates that much of the Pb-Zn mineralization in the area occurs.

Mapping by the Geological Survey of Canada has determined the limits of the carbonate strata, though precise age correlation of the different carbonate units is beset with difficulties. The following discussion of the rock units is therefore based only on the ages determined by the G.S.C. In general, Pb-Zn mineralization is concentrated in carbonates of Lower and Upper Hadrynian and Lower Cambrian, with the largest number of showings by far in the Upper Hadrynian dolomite units. The carbonate units are briefly discussed below, along with a listing of selected mineralized occurrences contained within them and both are depicted in the accompanying map of the Bonnet Plume River area.

Hsc, Hcs units

Both the Hsc and Hcs units are of Helikian age. Hsc consists of dark slate and argillite, with minor fine-grained quartzite and limestone whereas Hcs is made up of grey weathering, interbedded dark argillite and limestone with minor biotite calc-silicate hornfels.

Mineralized occurences include the following:

(1) Dolores Creek (MAMMOTH) - chalcopyrite ± cobaltite within veinlets and pods and disseminated in limy fine-grained clastics locally associated with hornblende-granite stock; uranium mineralization also reported.

Hc Unit

The Hc unit is of Upper Helikian age and consists of orange weathering, grey, pink and buff fine grained dolomite.

Mineralized occurrences include the following;

(2) ALE - pyrite, galena and sphalerite within open space fillings in brecciated dolomite
(3) LAD - chalcopyrite, malachite, tetrahedrite and azurite disseminated within limestone.

Hc Unit

The Hc unit is Lower Hadrynian in age. It has been divided into two subunits: Hc^1 and Hc^2. Hc^1 forms the lowermost portion of the Hc unit and consists of orange weathering banded dolomite and minor limestone. Generally, it is not as dominant as the upper Hc^2 subunit which is made up of grey weathering dolomite and limestone.

Occurrences of mineralization are few within this unit and include the following;

(4) Dolores Creek (DTG)- pyrite, galena and sphalerite within fracture and vein stockwork in proximity to several faults in the Hc^1 subunit.

Hd Unit

The Hd unit is Upper Hadrynian in age and has been divided into two subunits: Hd^1 and Hd^2. Hd^1 is the lowermost portion of the unit and consists of grey weathering, medium to thick bedded, fine-grained dolomite. It is much more extensive than the upper Hd^2 subunit of light grey, buff weathering, porous fine-grained dolomite. The Hd unit undergoes a facies change to the north where it merges into fine clastics of the Rapitan Group. To the east and south, the Upper Hadrynian carbonate units are predominantly limestone (Hls).

A large portion of the mineralized occurrences are situated within the Hd unit:

(5) Mount Profeit (DOC) - pyrite, galena, sphalerite and tetrahedrite within pods, fractures, veins, vugs and along faults in the Hd^1 subunit;

(6) Corn Creek (DEA) - galena and sphalerite within vugs and fractures;

(7) Corn Creek (DF) - pyrite, galena, sphalerite, chalcopyrite and tetrahedrite within pods and fractures associated with faults in Hd^1 subunit;

(8) Corn Creek (WX) - galena and sphalerite within vugs and fractures near a fault zone in Hd^1 subunit;

(9) Corn Creek (PING) - galena, sphalerite and pyrite in zebra dolomite breccia associated with faults in Hd^1 subunit;

(10) Harrison Creek (CYR et al) - galena, sphalerite and pyrite and barite with vugs, zebra dolomite breccia and fractures in Hd^2 subunit; bedded detrital sphalerite present;

(11) Harrison Creek (BOB et al) - galena, sphalerite and pyrite within zebra dolomite breccia, vugs and fractures;

(12) Nadaleen Mountain (TARA) - galena and sphalerite within fractures and zebra dolomite breccia, probably in Hd^1 subunit (Blusson, personal communication).

Ꞓc Unit

The Ꞓc unit has been assigned to the Backbone Ranges Formation of Lower Cambrian age, though it may be Hadrynian in part. It has been subdivided into two subunits: the lower $Ꞓc^1$ and the upper $Ꞓc^2$. Subunit $Ꞓc^1$ consists of pale buff grey weathering, poorly bedded, in part pisolitic dolomite, with minor quartzite whereas $Ꞓc^2$ is made up of buff yellow weathering, in part porous, fine grained dolomite.

Mineralized occurrences within this unit are not numerous and include the following:

(13) ANN et al - sphalerite and galena in breccia zones, fractures and as vug fillings

(14) Goz Creek (Barrier Reef) - sphalerite, galena, boulangerite, trace pyrite and marcasite within silicified dolomite breccia, vugs and fractures and disseminated within coarse crystalline dolomite in $Ꞓc^2$ subunit;

(15) GUS sphalerite and galena within vugs, fractures and veinlets;

(16) LIZ - sphalerite, minor galena and smithsonite within breccia zones in limestone and dolomite.

Ꞓcs Unit

The Ꞓcs unit has been assigned to the Sekwi Formation of Lower Cambrian age. It consists of brown and orange weathering, thin-bedded dolomite, grey and buff mottled limestone, brown shale and sandstone.

Few mineralized occurrences are within this unit and they include the following;

(17) Corn Creek (BOB) - galena, sphalerite, pyrite and chalcopyrite within vugs and algal lamination planes;

(18) CAB - bands of sphalerite parallel to the bedding in dolomitic host rocks and also as coarse crystalline sphalerite which in company with barite, quartz or calcite fills fractures and voids;

SDc Unit

The SDc unit is Silurian and Devonian in age and consists of light grey, well bedded dolomite with minor limestone near the top.

Mineralized occurrences within this unit include the following:

(19) AXE, NEST - sphalerite and smithsonite rim calcite - filled voids in dolomite and occur within irregular veinlets;

(20) BAR - sphalerite and galena as veinlets within a breccia zone and sphalerite pseudomorphous after fragments of algal reef;

(21) GYR - sphalerite and galena as veinlets and matrix in an intra clastic conglomerate and sphalerite possibly pseudomorphous after brachiopods;

(22) AL - sphalerite and galena within veinlets of calcite in SDc limestone and very minor bornite and chalcopyrite in a vuggy white quartz vein within Ɛcg along a contact between dolomite and a quartzite-siltstone unit.

TARA*
McIntyre Mines Limited

Zinc, Lead
106 C 2, 3, 6, 7
(64°12'N, 132°59'W)

Reference: Blusson (1974a).

Claims: TARA 1-250

Location and Access:

The property is located about 100 miles northeast of Mayo. Access is provided by float plane to Porter Puddle and 12 miles south-southwest from there to the property by helicopter.

History:

The property, staked in the summer of 1975, was found as a result of stream sediment geochemical sampling and follow-up prospecting.

Description:

The claim geology consists of Hadrynian red to maroon shales which are underlain by dolomite and overlain by Ordovician to Devonian carbonates. The dolomite unit is continuous over a distance of more than 70,000 feet and occurs along the perimeter of a bathtub shaped synclinal downwarp. It is sugary-textured near the top, but is zebra dolomitized in the lower portions.

Two types of mineralization have been noted. Type 1 mineralization consists of massive coarse-grained colloform galena, barite and minor sphalerite within grey, surgary-textured vuggy dolomite near the top of the dolomite unit close to the contact with overlying shales. Type 2 mineralization consists of medium-grained, pale yellow sphalerite and traces of red sphalerite as fracture fillings and breccia matrix in zebra dolomite. To date, the best mineralization is found to occur in dolomite closely associated with shales.

Current Work and Results:

During summer 1975, the claims were geologically mapped at a scale of 1 inch = 1,000 feet with a smaller portion at 1 inch = 200 feet. Reconnaissance soil geochemical surveys for zinc, lead and cadmium were conducted with samples obtained at 100 foot intervals along lines spaced 250 feet apart. Several anomalous areas have been outlined by the soil geochemistry and to date, seven diamond drill holes have been drilled, three holes with BQ core for a total of 2,436.5 feet and 4 holes with EXT core for a total of 206 feet. Drilling results were reported to be inconclusive.

KIDD
McIntyre Mines Limited

106 C 3, 105 N 14
(64°00'N, 133°07'W)

Reference: Blusson (1974a,b).

Claims: KIDD 1-36

Location and Access:

The property is located about 90 miles northeast of Mayo and is accessible by helicopter.

History:

The claims were staked during summer, 1975.

Description:

The property is underlain by the Hadrynian 'Grit Unit' and Devono-Mississippian black shales.

Current Work and Results:

A reconnaissance geochemical survey resulted in a high zinc geochemical anomaly which was investigated by means of a short diamond drill hole (37 feet). The drilling results were inconclusive.

TEX 106 C 6
Hercon Resources Limited (64°27'N, 133°00'W)

Reference: Blusson (1974b).

Claims: TEX 1-20

Location and Access:

The property straddles the Bonnet Plume River, about 10 miles northwest of Porter Puddle.

History:

The claims were recorded in March, 1975.

Description:

The property is underlain by a northwest trending shale unit (Hsq, Blusson, 1974b) which is overlain by dolomite of the Hd^1 unit, all of Hadrynian age. Minor pyrite and pyrrhotite occur in thin bands along the bedding planes in the shale and a small amount of secondary zinc mineralization is present in very localized fault zones in the dolomite.

Current Work and Results:

During summer 1975, the northeast portion of the property was subjected to detailed geological mapping (1 inch = 400 feet), and a geochemical soil and rock chip sampling program. About 150 soil samples were collected at 100 foot intervals along lines spaced 400 feet apart and analyzed for lead and zinc. No significant anomalies were determined.

FUN
Yukon Revenue Mines Limited
Cominco Ltd.

Zinc, Lead
106 C 7
(64°23'N, 132°46'W)

Reference: Blusson (1974b).

Claims: FUN 1-4

Location and Access:

The property is on the north side of the Bonnet Plume River near the mouth of Goz Creek and about 110 miles northeast of Mayo. Access is by fixed wing aircraft to Porter Puddle and from there by helicopter to the property.

History:

The claims were recorded in September 1973. During 1974, geological mapping and geochemical soil sampling were conducted and one geochemical anomaly outlined by the work.

Description:

The property is underlain by slate, siltstone, sandstone conglomerate and dolomite of Hadrynian age. Mineralization consists of galena and sphalerite in fault breccia in Upper Hadrynian dolomite.

Current Work and Results:

During summer 1975, three diamond drill holes (BQ core) were collared for a total footage of 701 feet and some mineralized fault breccias were intersected.

CYR, FXE, ED, PB, ZIN,
CYP, SCREW, ZOT, WHI
Cypress Resources Limited
British Newfoundland Exploration Limited

Zinc, Lead
106 C 7
(64°25'N, 132°53'W)

References: Blusson (1974b); Sinclair et al (1975, pp. 42-43).

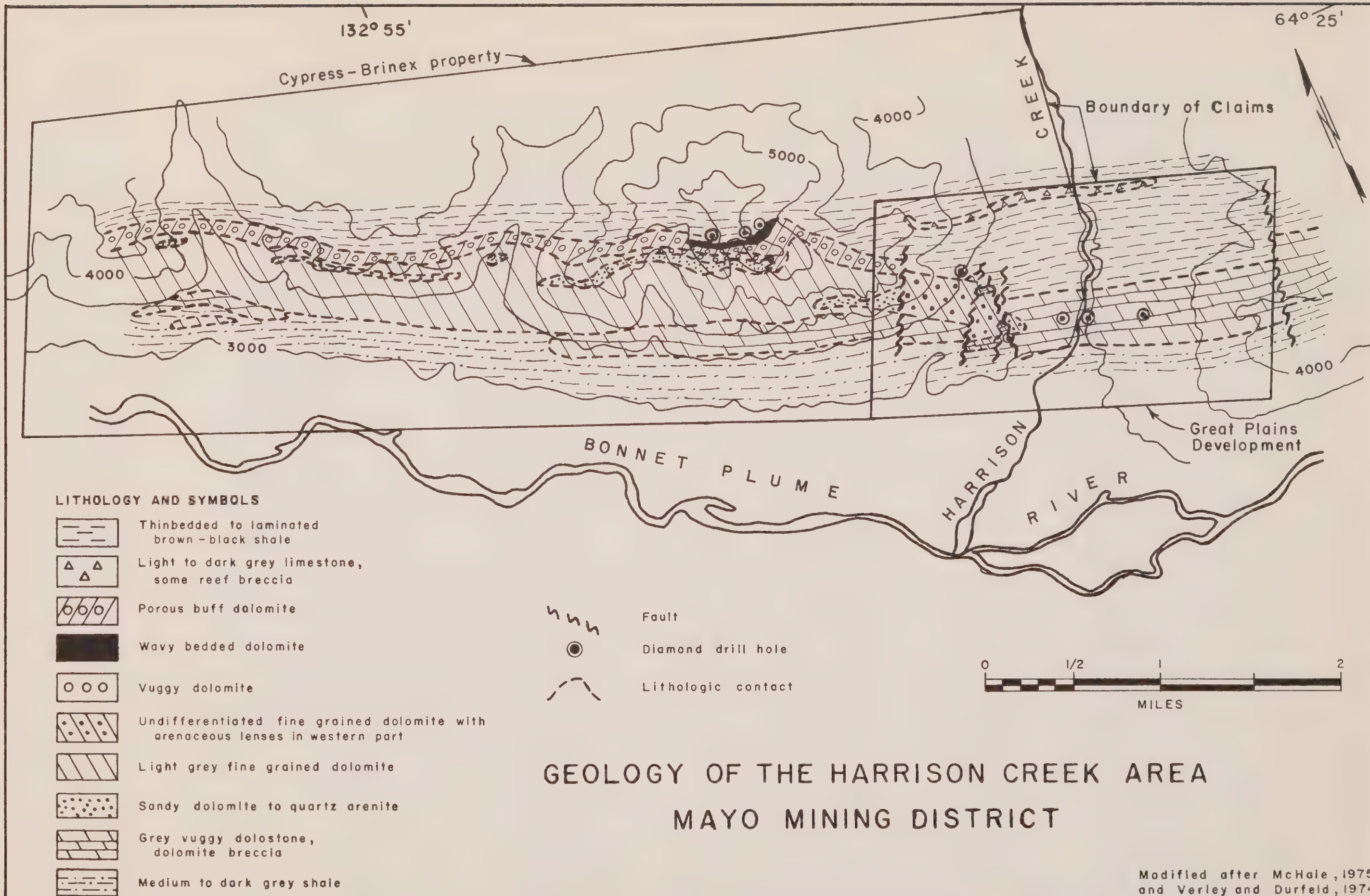
Claims: CYR 9-40; FXE 1-8; PB 1-8; ED 1-8; ZN 1-8; CYP 1-40; SCREW 1-16; ZOT 1-22; WHI 1-24

Location and Access:

The claims form a single block on the northeast side of the Bonnet Plume River, 110 miles northeast of Mayo and 13 miles northeast of Rackla Lake. They are contiguous with the Norcen Energy Resources (Great Plains Development) property which lies to the south and east. Access in 1975 was by fixed-wing aircraft from Mayo to Rackla Lake or Porter Puddle (six miles southeast of the property) and then by helicopter.

History:

The majority of the claims were staked in July and August 1973, following the lead-zinc discovery by Barrier Reef Resources on Goz Creek. Preliminary mapping and prospecting were carried out by Cypress Resources Limited in 1973 and three short holes were drilled, one of which encountered 28 feet of 8.3 per cent zinc (Northern Miner, November 1, 1973). Work on the property in



GEOLOGY OF THE HARRISON CREEK AREA
MAYO MINING DISTRICT

1974 was carried out by British Newfoundland Exploration Limited (Brinex) under an agreement with Cypress. The ZOT and WHI claims and fractions were staked during the summer of 1974.

In 1974, Brinex carried out an extensive program of exploration on the property which included geological mapping, soil and stream geochemical sampling, a limited I.P. survey, hand trenching and 3,000 feet of diamond drilling in seven holes. Mineralization of the dolomite appeared to be erratic and discontinuous in grade and size and no significant intersections were reported from the drilling.

Description:

The claims are underlain by a northwest-trending sequence of Hadrynian to Mississippian rocks which dip steeply to the northeast. The accompanying geological map shows the Hadrynian to Lower Cambrian succession in the area which consists mainly of dolomite and shale with minor limestone and sandstone. Most of the lead-zinc mineralization occurs within the dolomite units situated immediately below the laminated brown-black shale. The mineralization consists of sphalerite with minor galena, pyrite and smithsonite with accessory quartz, dolomite, minor barite and calcite. The sulphide mineralization is found in solution cavities and local collapse breccias, solution channel in fillings, primary bedded material and late stage cross cutting structures.

Current Work and Results:

During 1975, a program of further geological mapping (1 inch = 400 feet), geochemical soil sampling and trenching was conducted on the property. Approximately 1,350 soil samples were collected along lines spaced 200 feet apart, for a total line length of 166,600 feet and analyzed for Pb and Zn. Several soil geochemical anomalies were determined and trenching with the use of cobra drill and dynamite was carried out over them. However, no economic mineralization was found and a company geologist recommended no further work be done.

One interesting result from the 1975 program concerns the shales which lie stratigraphically below the main mineralized dolomite unit. They contain minor amounts of lead and zinc and leaching has resulted in the formation of iron oxide cemented "false gossans" that assay up to 3.2 per cent Zn. The soils over this unit are enriched in Pb and Zn and give a high response, but are thought not to be related to economic mineralization.

LEGEND

S — SHALE- dark gray and brown, very thin bedded to laminated silty shale and sandstone.

A — DOLOSTONE-medium to light gray and mottled gray, thick bedded to massive, fine to microcrystalline vuggy dolostone with minor solution breccia, chert. Locally arenaceous and pisolitic. Host unit for Pb-Zn mineralization.

B — SANDSTONE- light gray to brownish gray, very thin bedded to thinly laminated porous dolomitic quartz sandstone and dark gray non-calcareous shale. Abundant tangential crossbedding. Conglomeritic at base. Weathers gray to reddish brown. "Marker bed"

C — DOLOSTONE-medium to light gray, thin to thick bedded, fine to microcrystalline dolostone. Locally arenaceous, pisolitic.

G — SHALE- light brown, medium to dark gray, thin bedded to laminated phyllitic shale. Non-resistant.

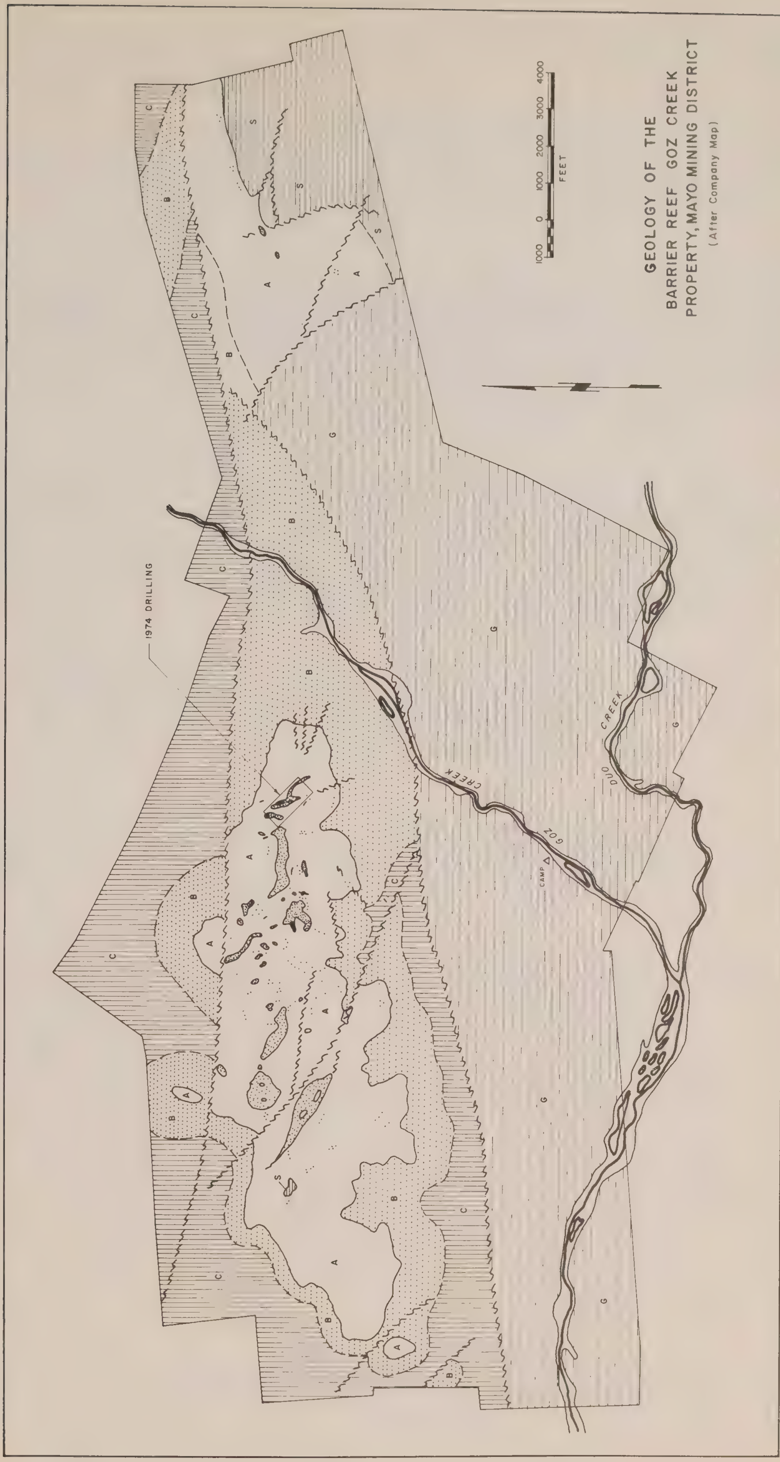
Lithologic contact, definite

Fault

Mineralized Areas:

Sphalerite

Smithsonite, Hydrozincite


GEOLOGY OF THE
BARRIER REEF GOZ CREEK
PROPERTY, MAYO MINING DISTRICT
(After Company Map)
1000 0 1000 2000 3000 4000
FEET
1974 DRILLING
CAMP
GOZ CREEK
DUO CREEK

Goz Creek Property
Barrier Reef Resources Limited

Zinc, Lead
106 C 7, 8
(64°25'N, 132°30'W)

References: Blusson (1974a); Sinclair *et al* (1975).

Claims: GAZ 1-8; LUV 1-8; DUO 1-8; STOL 1-8; VUH 1-8; WALT 1-8; LIN 1-8; ANN 1-8; BON 1-8; HAM 1-16; BAF 1-96; ANG 1-8; MEB (Fr).

Location and Access:

The property straddles Goz Creek just above its confluence with Duo Creek. Mayo lies 118 miles to the southwest. Access is by fixed wing aircraft from Mayo to Goz Lake or Rackla Lake, and thence by helicopter to the property.

History:

The original block of 192 claims was staked in June and July 1973 to cover widespread zinc-lead mineralization discovered during the course of a regional geological and geochemical reconnaissance program. The discovery resulted in a staking rush in the area which lasted through the following winter and on into the spring. Initial work on the Barrier Reef property consisted of detailed geological mapping and prospecting, measurement of stratigraphic sections and surface rock sampling.

In 1974, a diamond drilling program resulted in 20 holes drilled for a total of 6,639 feet. Assay results were as high as 32 per cent sulphide zinc and three per cent oxide and carbonate zinc in dolomite beds dipping 5° to 10° to the south.

Description:

The property is underlain by a sequence of carbonates and clastics of Lower Cambrian age (see accompanying diagram). At the base of the section is a recessive phyllitic shale (Unit G). This is overlain conformably by Unit C, a resistant, grey, thin- to thick-bedded, calcareous dolomite, locally vuggy and pisolitic. Total thickness of this unit is about 1,150 feet. A disconformity separates it from overlying Unit B,a very thin-bedded, dolomitic quartz sandstone about 150 feet thick. The sandstone is overlain by a thick-bedded to massive fine to microcrystalline calcareous dolomite (Unit A). Porous vuggy beds with local breccias and pisolitic textures are common. Total thickness of this unit is about 1,000 feet, although the upper part has been removed by erosion in the vicinity of Goz Creek. At the top of the exposed secion is a very thin-bedded, silty shale and sandstone unit about 1,000 feet thick, Unit S.

Regional deformation has resulted in a structural style characterized by west-northwest-trending fold axes and faults. Two prominent westerly-trending faults cut across the property, one across its northern edge and one about a mile farther south. Between these faults the upper dolomite unit is exposed in outcrop for about 5 1/2 miles in an east-west direction. Extensive showings of zinc and lead sulphides occur along this outcrop over a stratigraphic interval of about 400 feet.

The mineralization is mostly greenish-yellow and red crystalline sphalerite with minor amounts of galena. Secondary smithsonite, cerussite and hydrozincite are common. Minor boulangerite occurs with sphalerite at several locations. Trace amounts of pyrite and marcasite are present, and secondary

limonite is widespread. Several modes of mineralization are recognized: matrix in silicified breccia beds, vug fillings, fracture fillings and disseminations in coarse crystalline dolomite.

The showings are visualized as irregular stratabound bodies of high-grade disseminated sphalerite, and as breccia with sphalerite matrix. These are surrounded by areas of lower grade sphalerite vug and fracture fillings.

Current Work and Results:

In 1975 field program included detailed gological mapping of the central part of the property (1 inch = 100 feet) and geochemical soil sampling of all claims east of Goz Creek. The central part of the property was subjected to 35 diamond drill holes (BQ core) for a total footage of 13,764 feet. As stated in a public release, preliminary evaluation of drill results suggested "drill-indicated potential of about 12 million tons of ore averaging 8 per cent zinc in the upper dolomite horizon" (Northern Miner, December 25, 1975).

GYR, ADD, ETC*
Harman Syndicate

Zinc, Lead
106 C 10
(64°40'N, 132°40'W)

Reference: Blusson (1974b).

Claims: GYR 1-26; ADD 1-32; ETC 1-12

Location and Access:

The claims are located about 135 miles northeast of Mayo. Access is by helicopter from Goz Lake, about 15 miles southeast of the property.

History:

The GYR claims were staked in July 1974, and the ADD and ETC claims in August 1974.

Description:

The property is underlain mainly by Siluro-Devonian limestone with windows of Ordovician Road River Formation shale. The rocks are relatively flat lying and are in contact with a partially overthrust block of the Sheepbed Formation along a northwest trending thrust fault dipping gently to the east. Mineralization consisting of yellow sphalerite and minor galena occurs within a fossiliferous and conglomeratic facies of the Siluro-Devonian limestone. The sphalerite is present along with white sparry calcite as a conglomerate matrix filling, as thin veinlets and as sphalerite pdeudomorphs after fossil fragments. The abundant fossil fragments, rounded limestone clasts and locally discordant attitude of the fossiliferous and conglomeratic facies suggests a possible paleoenvironment for the accummulation of reef breccia.

Current Work and Results:

In 1974, the area was subjected to preliminary geological mapping at a scale of 1 inch = 1,000 feet and detailed mapping at a scale of 1 inch = 200 feet of the main showing area. Assay values of random grab samples ranged from about 1 per cent to 9 per cent zinc and a main mineralized zone was determined which covered an area approximately 1,000 feet by 200 feet in size. Recommendations for further work included more detailed mapping, trenching and about 2,000 feet of exploratory short hole diamond drilling.

PONG — 106 C 10
Bow River Resources Limited — (64°40'N, 132°55'W)
Highhawk Mines Limited

Reference: Blusson (1974a).

Claims: PONG 1-40

Location and Access:

The property is in the upper drainage area of Corn Creek, about 14 miles east of Pinguicula Lake and 115 miles northeast of Mayo. Access is by float plane from Mayo to Goz Lake or Pinguicula Lake, and from there by helicopter to the property.

History:

The claims were staked early in 1974 and field work was carried out in the summer of 1974.

Description:

The property is underlain by Hadrynian dolomite, shale of the Sheepbed Formation and dolomite of the Backbone Ranges Formation.

Current Work and Results:

During summer 1974, work consisted of a soil sampling program for Cu, Pb, Zn, over the contact area between the Hadrynian dolomite and the Sheepbed Formation. A total of 493 samples were collected at approximately 200 foot intervals along northeast-trending lines spaced 400 feet apart, within a grid about 14,500 feet by 2,500 feet in area. No significant anomalous copper values were obtained and only sporadic anomalous lead-zinc values were determined. Company geologists recommended follow-up geochemistry and prospecting to evaluate two of the anomalous lead-zinc zones.

BOB*
Cominco Limited

Lead, Zinc
106 C 10
(64°33'30"N, 132°56'W)

Reference: Blusson (1974a).

Claims: BOB 1-20

Location and Access:

The property is located about 115 miles northeast of Mayo. Access to the property is provided by float plane from Mayo to Pinguicula Lake and from there by helicopter, the remaining 14 miles to the southeast.

History:

The claims were recorded in August 1974 and July 1975.

Description:

The property is underlain by dolomite, quartzite and siltstone of the Lower Cambrian Sekwi Formation which is overlain by carbonates of the Ordovician Mount Kindle Formation. The rocks strike easterly with a very gentle dip to the north.

The main showing is exposed along the west side of a north-flowing creek draining into Corn Creek. The host rock is stromatolitic, orange to buff weathering, fine-grained dolomite of the Sekwi Formation with narrow vugs localized within stromatolitic zones. Some zebra structure is present. Coarse-grained galena, sphalerite, pyrite (marcasite?) and chalcopyrite constitute the mineralization. Three kinds of sphalerite are present; dark grey, red, and honey coloured. The mineralization is localized within vugs along the algal lamination planes of small moundlike bioherms, up to several feet in both length and width, and also along bedding planes in the dolomite. It occurs intermittently down dip for approximately 100 feet and for 50 feet along strike. Chip sampling of the main showing resulted in an average assay value of 0.69 ounces silver per ton, 5.86 per cent lead and 3.75 per cent zinc.

Current Work and Results:

During the summer of 1975, the property was subjected to geological mapping (1 inch = 1,000 feet), detailed prospecting and an induced polarization (I.P.) survey. The I.P. survey was conducted along five parallel lines spaced 100 m apart for a total length of 10 km, and it resulted in some weak responses in the southern portion of the main showing area. The company geologist did not recommend further work.

DF*
Cominco Ltd.
Canwex Exploration Limited

Lead, Zinc
106 C 10
(64°40'N, 133°00'W)

References: Blusson (1974b); Sinclair *et al* (1975, p. 57).

Claims: DF 1-81

Location and Access:

The property is located beside Corn Creek, about 12 miles east of Pinguicula Lake. Access is by fixed wing aircraft from Mayo to Pinguicula Lake and from there by helicopter to the property.

History:

The claims were staked in January 1974. During 1974, field work consisted of prospecting, geological mapping and a geochemical soil survey which outlined one coincident lead-zinc anomaly.

Description:

The property is underlain by Upper Hadrynian sediments, notably the Rapitan Group, the Keele Formation and the Sheepbed Formation. A more detailed description of the geology is given in the earlier report.

Two areas of mineralization occur on the property. One showing consists of dolomite breccia float with abundant buff fine-grained smithsonite. Mineralization encountered in drill holes consisted of minor fine- to coarse-grained sphalerite and pyrite within small vugs lined by quartz, sparry dolomite and with accessory pyrobitumen.

The main showing consist of galena, sphalerite, and minor chalcopyrite along with veinlets of coarse-grained sparry dolomite localized along a fault trending 070°/80°-85° south in dolomite breccia. Locally, traces of tetrahedrite are also present. The showing is situated near the middle of the Keele Formation and is located on the south side of a creek draining into Corn Creek. It is lens shaped in horizontal section, about 350 feet long and 60 feet maximum width.

Current Work and Results:

During 1975, parts of the property were subjected to detailed geological mapping (1 inch = 400 feet), geochemical grid soil sampling and IP survey. The geochemical grid was 200 feet by 400 feet and the IP grid, 50 m by 100 m.

Three trenches of 20 foot, 60 foot and 45 foot lengths were cut across the main showing. The centre trench resulted in assays of 2 1/2 ounces of silver per ton, 8 per cent zinc and 2 per cent lead. A diamond drill hole encountered the mineralized zone about 90 feet below the surface where it assayed less than 2 per cent lead-zinc over an interval less than 10 feet. In total, seven diamond drill holes were collared (BQ core) for a total footage of 1,704 feet.

MID
R.J. Hibbard

106 C 11
(64°34'N, 133°07'W)

Reference: Blusson (1974b).

Claims: MID 1-6, 11-16

Location and Access:

The property is located about 108 miles northeast of Mayo and 11 miles southeast of Pinguicula Lake. Access to the property is provided by float plane to Pinguicula Lake and thence by helicopter to the property.

History:

The claims were staked in March 1974.

Description:

The property is underlain by Lower Cambrian carbonates, quartzite, shale and sandstone which are overlain by dolomite of Siluro-Devonian age. The rocks strike northwesterly and dip gently to the northeast. No mineralization of economic interest has been found.

Current Work and Results:

A roconnaissance geochemical soil and stream sediment survey was conducted on the property in July 1974 for copper, lead and zinc. A moderately anomalous zone of zinc values occurs in the southern section of the property, but its trend could not be determined with the large sample spacing. Further work consisting of geological mapping, prospecting, and soil sampling on 400 foot line spacings and 100 foot sample intervals was recommended for the southern section of the property by a consulting geologist.

PING*
Bow River Resources Limited
Highhawk Mines Limited
Cominco Limited

lead, Zinc
106 C 11
(64°37'N, 133°15'W)

References: Blusson (1974b); Sinclair et al (1975, pp. 53-54).

Claims: PING 1-26

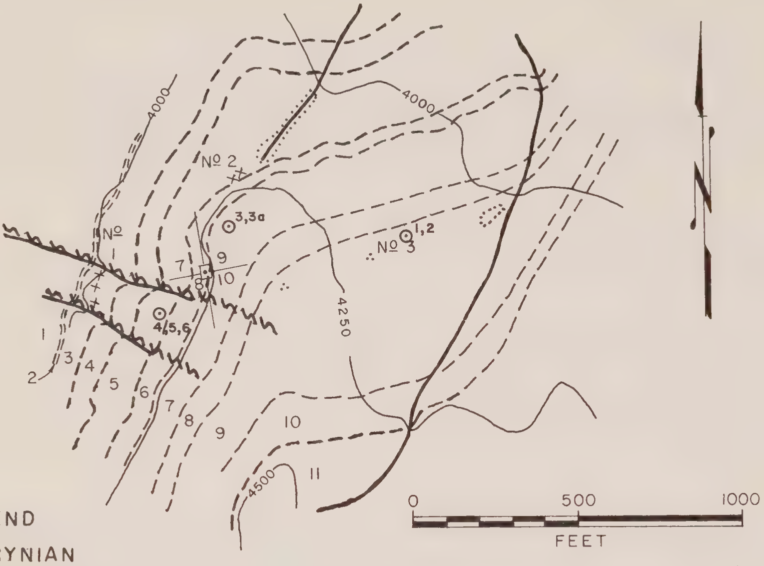
Location and Access:

The property is located about 107 miles northeast of Mayo and is accessible by float plane to Pinguicula Lake and from there by helicopter, 5 miles to the southeast.

History:

Most of the claims (1-24) were staked in January 1974 on the basis of a favourable geological environment as indicated on recently released G.S.C. geological maps. In addition, claims PING 25 and 26 were staked in September 1974. Geochemical work done in summer 1974 revealed several anomalous areas, and follow-up investigation resulted in the discovery of three main showings of lead-zinc mineralization in Hadrynian dolomite (Sinclair et al, 1975,). Detailed soil geochemistry and geological mapping were undertaken in August

GEOLOGY OF THE PING CLAIM GROUP, MAIN SHOWING AREA, BLACK CANYON CREEK. MAYO MINING DISTRICT



Modified after Travis, 1974

LEGEND

HADRYNIAN

KEELE FORMATION

11	Dolomite, microcrystalline, white to buff weathering.
10	Quartz pebble conglomerate; brown siltite and shale, frequently dolomitic.
9	Dolomite, stromatactoid, yellow-grey and black interbanded, medium to coarsely crystalline, sandy near base.
8	Shaly dolomite, orange weathering, platy, colour varies from light grey to black, pyritic.
7	Dolomite, finely crystalline, algal and stromatolite laminations, light grey colour.
6	Interbedded argillite and dolomite, dark grey to black, very pyritic.
5	Dolomite, dark and light grey laminations, possibly algal. Stromatactoid in places with frequent vugs. Minor pisolite beds.
4	Dolomite, medium grained with many sandy sections, carbonaceous.
3	Dolomite, microcrystalline, light grey, intensely recrystallized to coarsely crystalline white dolospar in places; minor dark shale beds.
2	Dolomite, medium crystalline, black, finely laminated with minor argillite laminae.
1	Dolomite, black and white, interbanded, coarsely crystalline.

Inferred fault

Lithologic contact

Pb-Zn mineralization, outcrop, float

7 9 / 8 10 Claim post

Diamond drill hole

1974 in the vicinity of the main showings. The property is jointly owned by Bow River Resources Limited and Highhawk Mines Limited and is covered by an option agreement whereby Cominco Limited can earn up to a 70 per cent interest.

Description:

The property is underlain by rocks of Hadrynian to Ordovician-Silurian in age. The oldest strata are Upper Rapitan Group clastic sediments and carbonates witch range from slate and argillite to sandstone and quartzite. Most units are ferruginous and are frequently interbedded with platy orange weathering dolomite. The Keele Formation overlies the Rapitan Group and is mainly dolomite with minor clastic intercalations (see accompanying diagram). Overlying the Keele Formation is the Sheepbed Formation which is largely comprised of dark grey to black recessive weathering shale and argillite with minor limestone and quartzite. The unit is poorly exposed on the property and may be partially removed by the overlying unconformity. Ordovician-Silurian carbonates containing pods of black argillite and locally reefal fossils, overlie the older sediments unconformably and are exposed on the southwest edge of the property.

All rock units on the property strike northeast and dip gently to the east. They are cut by normal faults striking primarily southeast and appear to be on the north limb of a southeast trending syncline (Blusson, 1974a).

Mineralization on the property is found in different stratigraphic horizons of the Keele Formation dolomite, frequently in the vicinity of faults. Two main showings have been located on the PING group. The No. 1 showing, exposed along the sloping east bank of a creek consists of about 3 per cent coarse-grained galena and red to honey sphalerite with coarse-grained white dolospar forming the matrix of a breccia. Fine-grained grey dolomite form the breccia clasts and above and below the mineralized zone, the dolomite is marked by well banded zebra structure. The mineralized zone is exposed for about 35 feet up and down the bank slope and about 125 feet along the length of the creek.

The No. 2 showing is about 150 feet stratigraphically above the No. 1 showing and consists of similarly mineralized dolomited breccia. The No. 3 showing is a float zone with sporadic occurrences of boulders of massive coarse-grained red sphalerite with minor galena.

Current Work and Results:

In the summer of 1975, further geological mapping of the claim group was performed at a scale of 1 inch = 100 feet, along with an IP survey and follow-up diamond drilling (AQ core). Coincident geochemical and IP anomalies over the float zone (No. 3 showing) led to the drilling of diamond holes 75-1 and 75-2 which encountered very minor sphalerite-galena, and a 4 foot interval of 6.17 per cent lead and 5.76 per cent zinc. The IP rsponse in the area was ascribed to the presence of pyrite.

DDH 75-3 and 75-3A were drilled in the No. 2 showing and did not encounter any significant mineralization.

DDH 75-4, 75-5 and 75-6 were drilled behind the main No. 1 showing. Only holes 75-5 and 75-6 encountered significant mineralization and their intersections are tabulated below, together with assays of trench samples from three sections cut across the 100 foot long surface exposure of No. 1 showing:

Hole No.	Attitude	Intersection	Interval	Pb wt %	Zn wt %	Ag oz/ton
75-5	-55°	209'-242'	33'	7.9	14.84	1.75
		179.5'-186.5'	7'	5.9	13.29	1.00
75-6	-75°	199'-217'	18'	13.62	1.25	1.97
Trench			11'	15.47	2.67	3.0
"			17'	1.59	1.65	0.17
"			27'	13.85	13.18	2.94

BALLS, SAM
Cominco Ltd.

Lead, Zinc
106 C 11
(64°39'N, 133°05'W)

Reference: Blusson (1974b).

Claims: BALLS 1-10; SAM 1-14

Location and Access:

The property is located north of Corn Creek, about 120 miles northeast of Mayo. Access to the property is via fixed-wing aircraft from Mayo to Pinguicula Lake and then by helciopter, a distance of 10 miles to the east.

History:

The claims were staked during March and July 1975 by Bow River Resources and optioned by Cominco in July 1975. Prior to Cominco's optioning of the property, personnel employed by Bow River Resources prospected the property and completed a small geochemical survey.

Description:

The claims are underlain by rocks, tentatively assigned to the Upper Hadrynian Keele Formation, and consist of several northwest-trending dolomite units with minor limestone and quartzite.

Mineralization is sparse and consists of sphalerite, galena and minor tetrahedrite in vugs and fractures. The best mineralization is exposed in a talus zone approximately 300 feet long and 6 to 35 feet in width in close proximity to a fault. It occurs at an elevation of 4,900 feet above sea level and consists of honey coloured to brown sphalerite and lesser galena as disseminations and thin veinlets in a chocolate-brown weathering dolomite. The average grade for the zone is 0.84 per cent Pb-Zn across an average width of 17 feet.

Current Work and Results:

During July 1975, the property was subjected to geological mapping (1 inch = 500 feet) and geochemical soil sampling for lead and zinc. Twenty-nine soil samples were collected at intervals of 200 feet along 2 lines spaced 1,000 feet apart. Anomalous values were correlated with surface mineralization. Company geologists recommend that further work should consist of trenching in the best mineralized area.

DEA
Spectroair Explorations Limited
Cominco Limited

Lead, Zinc
106 C 11
(64°43'N, 133°02'W)

Reference: Blusson (1974b).

Claims: DEA 1-72

Location and Access:

The property is on the upper part of Corn Creek, 11 miles east of Pinguicula Lake. Access is by fixed wing aircraft from Mayo to Pinguicula Lake and from there by helicopter to the property.

History:

The DEA 1-70 claims were recorded on September 25, 1973 and the DEA 71 and 72 claims were added a year later.

In 1974, geological mapping, geochemical soil sampling and some hand trenching were conducted. Two coincident lead-zinc anomalies were outlined by the soil survey.

Description:

The property is underlain by medium- to thick-bedded, fine-grained dolomite of Hadrynian age. Scattered occurrences of sphalerite and galena have been found in vugs, fractures and breccia zones within the dolomite.

Current Work and Results:

During summer 1975, three diamond drill holes (BQ core) were collared for a total footage of 1,103 feet. Minor disseminated lead-zinc mineralization was encountered in all holes.

Dolores Creek*
Amax Exploration Incorporated

Lead, Zinc
106 C 13
(64°49'N, 133°36'W)

References: Blusson (1974b); Sinclair et al (1975, p. 62).

Claims: DTG 1-144

Location and Access:

The claims are situated on the east side of the Bonnet Plume River, roughly two miles south of Dolores Creek. Access is by float plane to Pinguicula Lake, nine miles to the southeast, and then by helicopter.

History:

The claims were staked in 1974 as a follow-up on a reconnaissance stream sediment geochemical program for Pb-Zn. In 1974, preliminary mapping, prospecting and sampling were conducted.

Description:

The property is underlain by a synclinal east-west-trending sequence of Hadrynian carbonate and clastic rocks which lie unconformably on Helikian sediments. Numerous northeast, northwest, and east-northeast trending faults disrupt the local stratigraphy and hamper correlation of units.

Mineralization consists of fracture fillings and veinlets of quartz, dolospar, galena, sphalerite, pyrite and hydrozincite within a well bedded unit of grey to black, fine-grained dolomite of Hadrynian age. The mineralized zone appears restricted to an extensive fault structure striking westerly and characterized by intermittent sheared and sheet-jointed zones up to 20 feet wide. It occurs at an elevation of approximately 4,500 feet above sea level and has a surface area of at least 1,000 feet by 1,000 feet with an approximate stratigraphic thickness of 400 feet. Channel samples from separate outcrops within the main showing returned values up to 1.74 per cent zinc and 0.24 per cent lead across 20 feet.

Copper mineralization also occurs on the property in a Helikian interbedded sequence of maroon sandstones and conglomerates (Hs). Chalcopyrite, hematite, pyrite, malachite and azurite returned assay values of 1.34 per cent copper and 0.44 ounces of silver per ton across 0.5 feet.

Current Work and Results:

During the summer of 1975, work consisted of prospecting and geological mapping (1 inch = 500 feet) with some sporadic geochemical sampling for Cu, Pb, Zn, Ag. Further work recommended by company geologists included more detailed geological mapping and prospecting.

ALE — Lead, Zinc
Cyprus Anvil Mining Corporation Limited — 106 C 13
(64°52'N, 133°45'W)

Reference: Blusson (1974b).

Claims: ALE 1-6

Location and Access:

The claims are located on the west bank of the Bonnet Plume River, 12 miles south of Fairchild Lake and 110 miles northeast of Mayo. Access is provided by float plane from Mayo to Fairchild Lake and from there by helicopter to the property.

History:

The claims were staked in August 1975.

Description:

The property is underlain by carbonates of Helikian age, and the mineralization consists of open space fillings of pyrite, galena, and sphalerite in brecciated portions of buff-weathering dolostone. The showings occur along a strike length of 1,600 feet and are on strike with similar showings on the former LAD claims, 8,000 feet to the southeast on the east bank of the Bonnet Plume River.

Current Work and Results:

During 1975, a geochemical soil sampling program was conducted along a small grid for Cu, Pb, Zn. Soil samples were collected at 200 foot intervals along 3 north trending lines spaced 200 feet apart for a total length of 10,000 feet. Anomalous Pb-Zn values were encountered along the strike extensions of the mineralized areas and the company geologist recommended further work which included additional geochemical soil sampling, hand trenching and geological mapping.

Mount Profeit*
Amax Exploration Incorporated

Lead, Zinc, Copper
106 C 14
(64°49'N, 133°03'W)

References: Blusson (1974a); Sinclair et al (1975, pp. 60-61).

Claims: DOC 1-150

Location and Access:

The property lies to the north of and straddles Mount Profeit, roughly 15 miles northeast of Pinguicula Lake. Access in 1975 was by float plane to Pinguicula Lake and thence by helicopter to the property.

History:

The claims were staked in July 1974 as a result of follow-up prospecting on a stream sediment geochemical anomaly. In 1974, work consisted of preliminary mapping, prospecting and sampling.

Description:

The property is underlain by Hadrynian clastics and carbonates which strike north-northwest and dip moderately to the east. In the northern portion of the property, Upper Hadrynian dolomite (Unit Hd^1, Blusson, 1974a) changes facies northwesterly into dominantly basinal clastics of the Rapitan Group. The Hadrynian dolomite and shale unconformably overlie older Hadrynian thin bedded dolomite, siltstones and shale (Unit Hsc). Several faults with small displacement occur and northeasterly trending sheet jointing and local shearing are present in the area of the main showing. Small folds are locally present beneath an unconformity in the older Hadrynian units.

Lead-zinc mineralization on the property is scattered mainly within a 1,000 foot thick portion of Unit Hd^1 consisting of light grey weathering, mottled, vuggy, stromatolitic dolomite. The main mineralized showings are sporadically exposed on the eastern slope of Mount Profeit from 5,100 to 5,900 feet elevation above sea level within a 2,000 foot by 4,000 foot area and the modes of mineralization include massive pods, breccia and fracture fillings in shear and sheet jointed zones, irregular replacement patches, vug fillings or linings and stratabound bedding plane and fracture fillings. The mineralization consists of some or all of the following: galena, sphalerite, tetrahedrite, pyrite, marcasite with secondary smithsonite, hydrozincite and malachite. The largest massive pod (31 feet by 27 feet) of galena and red-green sphalerite with minor tetrahedrite gave the following assay over 31 feet: 16.8 per cent zinc, 47.2 per cent lead, 17.2 ounces of silver per ton. A 21 foot sample across a shear zone assayed 3.48 per cent lead, 6.60 per cent zinc, and 2.00 ounces of silver per ton. The clustering of showings within the Hd^1 unit suggests some sort of stratigraphic control.

Current Work and Results:

During 1975, prospecting and detailed geological mapping at a scale of 1 inch = 500 feet were carried out on the property in addition to sporadic geochemical soil sampling. Company geologists recommended further work consisting of 5,000 feet of diamond drilling in 8 to 10 holes to test extensions and controls of the mineralization.

PTERD, PNERD, KNIT, PTOES, SKIN — Uranium
Archer-Cathro (Wernecke Joint Venture) — 106 C 14
(64°57'N, 133°18'W)

Reference: Blusson (1974a).

Claims: PTERD 1-10; PNERD 1-4; KNIT 1-8; PTOES 1-8; SKIN 1-4

Location and Access:

The property is located about 13 miles east of Fairchild Lake and 120 miles northeast of Mayo. Access in 1975 was provided by helicopter from Kiwi Lake, 43 miles to the northwest. An emergency airstrip is located about 2 miles south of the property, near the junction of Tetrahedrite and Cobalt creeks.

History:

The PTERD claims were staked in July 1975, PNERD in August and KNIT, PTOES and SKIN in September 1975.

Description:

The claims are underlain by carbonate and clastic rocks of Helikian age - Unit Hcs and Hsc (Blusson, 1974a). Mapping by company geologists also identified fine-grained metavolcanics with mudstone interbeds, calc-silicates, and an orange weathering argillaceous dolomite.

Uraniferous float has been located in a boulder train. In addition, chalocpyrite with minor cobaltite occurs as disseminations and fractures in metavolcanics at the headwaters of Cobalt Creek.

Current Work and Results:

During summer 1975, a portion of the property was geologically mapped at a scale of 1 inch = 500 feet. In addition, a radiometric survey was conducted over a grid area of about 700 feet by 2,200 feet. Readings were taken with a scintillometer at 50 foot intervals along lines spaced 100 feet apart.

CH, REUBEN
United Keno Hill Mines Limited

Silver, Lead, Zinc
106 D 4, 105 M 13
(64°00'N, 135°35'W)

Reference: Sinclair et al (1975, p. 14).

Claims: CH 1-224; REUBEN 1-6

Location and Access:

The claims are situated on Chambers Hill, approximately six miles northwest of Elsa, and are joined on the southwest by the REUBEN claims. Access to the claim block is mainly by helicopter, although two poorly maintained tote trails to near the southern claim group boundary do exist: one from the south McQuesten Road to the Shanghai workings and one from the Hansen Lake Road to the vicinity of the old U.R. group.

History:

Previous work on the CH group is documented in Sinclair et al (1975). In late 1974, the REUBEN claims (formerly TEX 1-6) were staked adjoining the CH group on Chambers Hill.

Description:

CH group geology is described in Sinclair et al (1975). The REUBEN claims are underlain by a thick sequence of thick-bedded quartzite interbedded with sericite schist. In addition, quartz-feldspar porphyry, biotite lamprophyre and greenstone sills occur which may be continuous with similar units on the Shanghai property to the west and the CH group to the east.

Structure on the claim groups is complex and consists of northwest, northeast and north trending elements. Two unmineralized major crossfaults on the property have a northwest trend whereas several mineralized vein faults with a northeast trend are present on the REUBEN and CH group. The north trending lineations are probably related to crossfaults.

The former Shanghai Mine with 2,200 feet of underground workings is located on the REUBEN claim group. Mineralization is concentrated in two mineralized vein faults, the No. 1 and No. 2 vein zones. The No. 1 vein zone trends northeast and dips steeply to the northwest. High zinc values were encountered near the portal, but the rest of the vein appeared to be poorly mineralized, though three diamond drill holes encountered high silver values in the hanging wall. The No. 2 vein zone is about 200 feet southeast of the No. 1 vein and is heavily mineralized with pyrite, minor galena and sphalerite. Numerous rusty fractures containing siderite are also present in outcrops on the property.

Current Work and Results:

In 1975, geological mapping (1 inch = 400 feet) was conducted on the REUBEN claims and on favourable areas of the CH group not previously covered. Mineralized veins and showings were examined and sampled. Preliminary and detailed geochemical soil sampling was conducted on the REUBEN and CH claims to trace known and inferred vein zones. About 2,400 soil samples were collected along lines spaced 300 feet apart at 100 foot intervals (locally 100 feet by 100 feet) and analyzed for Ag, Pb, Zn. Several anomalies were determined, most of which correlated with already known zones of mineralization.

Recommendations for further work included overburden drilling of mineralized vein zone areas, detailed prospecting and bulldozer trenching of three geochemical anomalies.

WILL
Cyprus Anvil Mining Corporation

Zinc. Lead, Copper
106 D 7
(64°24'N, 134°42'W)

Reference: Green (1972).

Claims: WILL 1-60

Location and Access:

The property is located near Mount Williams, about six miles north of the Beaver River and 68 miles northeast of Mayo. Access during summer is by helicopter from Mayo, although the Wind River winter road passes six miles west of the claim group.

History:

The claims were staked during July 1975 as a follow-up on several geochemical anomalies and lead-zinc showings discovered during a regional geochemical survey.

Description:

The claims are underlain by Helikian shale and dolomite. The predominant orange weathering, light and dark grey interbedded argillaceous dolomite and chert unit trends northwest and dips gently to moderately to the northeast. Brown to black, thin bedded shales occur throughout the dolomite unit.

Mineralization consists of light brown to yellow sphalerite, minor galena, chalcopyrite and sparry dolomite as matrix in a tectonic breccia and as thin fracture fillings within the main dolomite unit. Numerous showings occur throughout the dolomite unit. The main showing consists of mineralization in a tectonic breccia over a strike length of roughly 2,000 feet with widths up to 50 feet. A metal zonation has been determined in the showing which consists of an upper copper-zinc zone and a lower lead-zinc zone. An estimated average grade of 10 per cent combined Cu, Pb and Zn over a 20 foot width has been postulated for the length of the showing.

Current Work and Results:

During the summer of 1975, the property was subjected to preliminary geological mapping (1 inch = 1,320 feet) and geochemical soil sampling for Cu, Pb, Zn. One hundred and ten geochemical soil samples were collected along the banks of creeks in the local area. Most of the lead and zinc anomalies are directly related to the known showings, though several anomalies do occur in the north half of the claim group where no showings have been found to date. Company geologists recommended further work consisting of geological mapping, chip sampling and possibly diamond drilling.

A
Dawson Range Mines Limited

106 D 7
(64°25'N, 134°55'W)

Reference: Green (1972).

Claims: A 1-16

Location and Access:

The property is located on the east side of Blaine Creek, a tributary of Beaver River, about 65 miles northwest of the town of Mayo. Access is by helicopter from Mayo or by a winter tote road from Mayo along Blaine Creek.

History:

The claims were staked in August 1974.

Description:

The claim group straddles the contact zone of a Proterozoic dolomite unit that was intruded by a large stock of gabbro. The mineralized zone consists of interbanded galena, sphalerite, chalcopyrite, pyrite and pyrrhotite in a tremolite skarn zone. It has been exposed in the creek for a distance of 20 feet and can be traced north for approximately 300 feet.

Current Work and Results:

Reconnaissance prospecting and a brief geological examination of the showing were carried out. A chip sample of the main mineralized zone assayed 7.13 per cent lead, 2.61 per cent zinc, 0.40 per cent copper, 1.57 ounces per ton silver and .003 ounces per ton gold.

BOND
Archer-Cathro (Wernecke Joint Venture)

Uranium
106 D 10
(64°40'N, 134°57'W)

Reference: Green (1972).

Claims: BOND 1-96

Location and Access:

The claims are located about 80 miles northeast of Mayo in the vicinity of the headwaters of Bond Creek. Access was provided by helicopter from Kiwi Lake, about 40 miles to the north.

History:

The claims were staked in June and September, 1975.

Description:

The property is underlain by by a window of Proterozoic rocks which are surrounded by Ordovician and Silurian limestone and dolomite. Shale, argillite and quartzite comprise the Proterozoic undivided Unit 1 as mapped by Green (1972). Further mapping by company geologists has shown that locally, the Proterozoic rocks consist of fine-grained metavolcanics with mudstone interbeds. The sequence has been complexly folded and the metavolcanics are foliated in an east-west direction.

Two areas of uranium mineralization have been located. The first consists of a vein occurence of siderite-quartz (±) barite with accompanying minor chalcopyrite, pyrite and pyrrhotite and the second consists of several radioactive, iron and manganese stained, lensoid zones in foliated and brecciated metavolcanics.

Current Work and Results:

During summer 1975, a portion of the claim group was subjected to programs of detailed geological mapping (1 inch = 200 feet), soil geochemistry and a radiometric survey. Soil samples were taken at 200 foot intervals along lines spaced 400 feet apart over a grid area of 2,400 by 8,800 feet. In addition, radiometric measurements were taken at 50 foot intervals along grid lines spaced 400 feet apart and several small anomalies were located.

BOZO	Uranium
Archer-Cathro (Wernecke Joint Venture)	106 D 10
	(64°40'N, 134°45'W)

Reference: Green (1972).

Claims: BOZO 1-16

Location and Access:

The claims are located about 80 miles northeast of Mayo along a tributary of Bond Creek. In summer 1975, access to the property was provided by helicopter from Kiwi Lake, 40 miles to the north. The Wind River Trail, a winter road, passes less than five miles east of the claims but is separated from them by rugged topography.

History:

The claims were staked in June 1975.

Description:

The property is underlain by a window of Proterozoic rocks surrounded by Ordovician and Silurian limestone and dolomite. Shale, argillite and quartzite comprise the Proterozoic undivided Unit 1 as mapped by Green (1972). Further mapping by company geologists has shown that locally, the Proterozoic rocks consist of fine-grained tuffaceous metavolcanics with mudstone interbeds.

Mineralization occurs within a weakly radioactive gossan which consists of up to fifty per cent disseminated pyrite and marcasite with minor magnetite and barite and a trace of chalocpyrite in brecciated volcanics over an area approximately 600 feet long and 400 feet wide.

Current Work and Results:

During the summer of 1975, the property was subjected to detailed geological mapping (1 inch = 100 feet), soil geochemistry and radiometric surveys. Soil samples were taken at 200 foot intervals on lines 200 feet apart within a grid area about 1,600 feet by 1,000 feet. In addition, radiometric measurements were taken at 50 foot intervals on lines 100 feet apart and an anomalous area approxumately 150 feet long and 75 feet wide was located on the eastern side of the gossan.

PIKE | Uranium
Archer-Cathro (Wernecke Joint Venture) | 106 D 16, 106 E 1
(65°00'N, 134°26'W)

References: Green (1972); Norris (1975).

Claims: PIKE 1-14

Location and Access:

The property is located about 110 miles northeast of Mayo and access was provided by helicopter from Kiwi Lake, 15 miles to the north.

History:

The claims were staked in June 1975.

Description

The claims are underlain by Lower Proterozoic Unit HO (Norris, 1975) phyllitic argillites and quartzites. Further mapping by company geologists has shown the rocks to consist locally of three units: a fine-grained, locally phyllitic, metavolcanic with mudstone interbeds, a grey to black phyllitic argillite and an interformational breccia.

Mineralization consists of traces of brannerite in fractures within the phyllitic argillite.

Current Work and Results:

During the summer of 1975, the property was subjected to detailed prospecting, soil geochemistry and radiometric survey programs. Soil samples were collected at 200 foot intervals along lines spaced 400 feet apart within a grid area of 3,600 feet by 3,000 and uranium anomalies were determined in two separate areas of the claim group. Radiometric measurements were taken at 50 foot intervals along grid lines spaced 400 feet apart but no specific anomalous zones or trends were determined.

BEV* | Zinc
Great Plains Development Company | 106 E 1
of Canada Limited | (65°12'N, 134°15'W)

Reference: Norris (1975).

Claims: BEV 1-20

Location and Access:

The property is located about 130 miles northeast of Mayo and 12 miles southeast of Margaret Lake. Access to the property is provided by float plane to Margaret Lake and from there by helicopter to the property.

History:

The claims were staked during summer 1974 as a follow-up on a reconnaissance stream sediment geochemical program in the Bonnet Plume area.

Description:

The property is underlain by Helikian limestones (Unit H2, Norris, 1975) in fault contact with mudstone breccia of the Hadrynian Rapitan Formation in the southern portion. The rocks are tightly folded into a series of synclines and anticlines and have been faulted in several places.

Minor mineralization occurs within black, fine-grained limestone adjacent to a northwest trending fault. It consists of colloform marcasite, coarse-grained yellow sphalerite and galena.

Current Work and Results:

During the summer of 1975, the property was subjected to geological mapping (1 inch = 1,060 feet) and a soil geochemical survey. Soil samples were collected at 100 foot intervals along 100 foot contour lines and analyzed for Pb, Zn, Cd. The survey determined a weak open zinc anomaly which corresponded to a change in lithology from grey microcrystalline to yellow weathering limestone. Further geochemical sampling was subsequently undertaken but the results are unknown at present.

OTIS — Uranium
Archer-Cathro (Wernecke Joint Venture) — 106 E 1
(65°02'N, 134°24'W)

Reference: Norris (1975).

Claims: OTIS 1-64

Location and Access:

The claims are located about 120 miles northeast of Mayo and are accessibel by helicopter from Kiwi Lake, 14 miles to the northwest.

History:

The claims were staked in June 1975.

Description:

The property is underlain by Lower Proterozoic phyllitic argillites and quartzites (Unit HO, Norris, 1975). Further mapping by company geologists has subdivided this unit locally into a fine-grained, locally phyllitic, metavolcanic with mudstone and breccia interbeds, calc-silicate and a grey to black phyllitic argillite. Major north and west trending faults disrupt the rock units in the claim area.

Mineralization consists of occasional coarse disseminations of brannerite commonly surrounded by brick red halos of hematite alteration and associated with both the north and west trending faults.

Current Work and Results:

During summer 1975, geological mapping (1 inch = 1/2 mile), soil geochemistry and radiometric survey programs were conducted. Soil samples were taken at 100 foot intervals along 700 foot long lines spaced 200 feet apart within a grid area of 9,200 feet by 700 feet. Only small erratic uranium anomalies were located. In addition, radiometric measurements were made at 50 foot intervals along the grid lines and several anomalies were located.

WERNECKE
Archer-Cathro (Wernecke Joint Venture)

Uranium
106 E 1
(65°08'N, 134°23'W)

Reference: Norris (1975).

Claims: WERNECKE 1-82

Location and Access:

The property is located on Quartet Mountain about 120 miles northeast of Mayo and access is provided by helicopter from Kiwi Lake, eight miles to the northwest.

History:

The claims were staked in June (1-42) and September (43-82) 1975.

Description:

The claims are underlain by Lower Proterozoic phyllitic argillite and quartzite (Unit HO, Norris, Further mapping by company geologists has shown the rocks to locally consist of fine-grained metavolcanics with breccia and mudstone interbeds.

Uranium mineralization consisting of brannerite with traces of thorite and uranothorite occurs disseminated within pink to brown banded metavolcanics in the vicinity of a similarly mineralized quartz vein on the north side of Quartet Mountain.

Current Work and Results:

During summer 1975, the property was subjected to detailed geological mapping (1 inch = 900 feet and 1 inch = 100 feet), soil geochemistry and airborne and ground radiometric survey programs.

A contour airborne radiometric survey was flown around Quartet Mountain at 500 foot elevation intervals and several anomalous zones were determined. In addition, ground radiometric measurements were made at 50 foot intervals along lines spaced 100 feet apart over the quartz veined area.

FLUNK
Ogilvie Joint Venture
c/o Archer, Cathro and Associates Limited

Zinc, Lead
106 E 2
(65°06'N, 134°52'W)

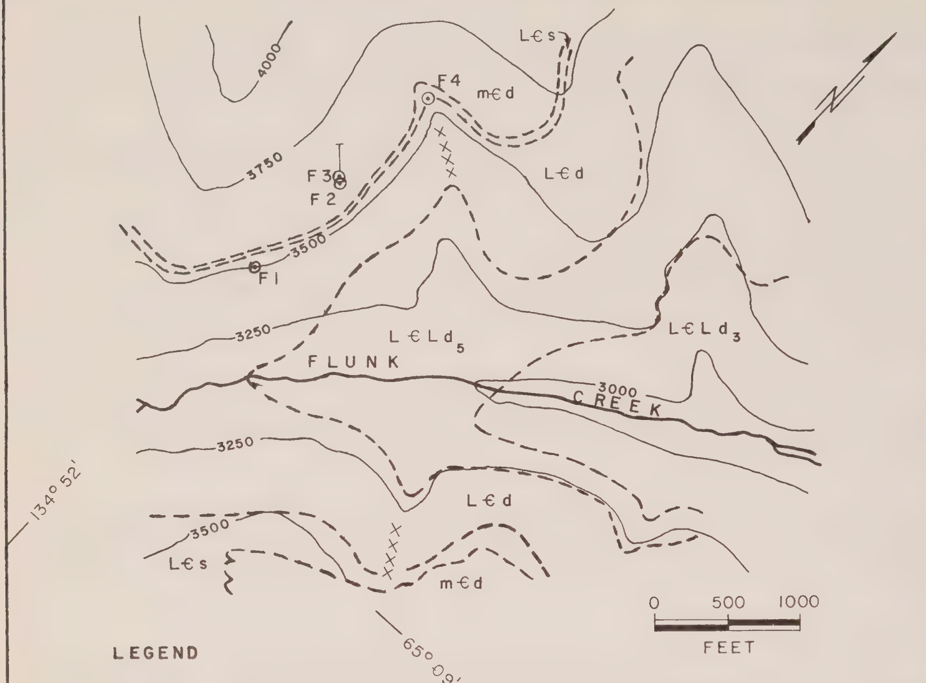
References: Norris (1975); Dawson (1975).

Claims: FLUNK 1-164

Location and Access:

The FLUNK claims are situated 18 miles southwest of Margaret Lake. Access in 1975 was by fixed wing aircraft to Kiwi Lake (eight miles southwest of Margaret Lake) and then by helicopter to the property.

GEOLOGY OF THE FLUNK CLAIM GROUP, MAIN SHOWING AREA, ILLTYD CREEK, MAYO MINING DISTRICT



Modified after Archer, 1976

LEGEND

MIDDLE CAMBRIAN

M€d	Massive light grey dolomite

LOWER CAMBRIAN

L€s	Dark grey, purple or green dolomitic shale
L€d	Red-brown weathering thick bedded, reefoidal dolomite, generally porous, vuggy, brecciated with tertiary dolomite, host of Pb-Zn mineralization
L€Ld	3-Thin bedded limestone with clastics, trilobites, oolites and oncolites 5-Oncolitic, thin bedded, shaly dolomite

◉ ◉⊣ Diamond drill hole, vertical inclined

× × × Pb-Zn mineralization

– – – Lithologic contact

History:

The claims were staked in June and July 1974 during a program of regional geochemical reconnaissance and prospecting. In 1974, work consisted of geological mapping and geochemical surveys.

Description:

The property is underlain by a series of Middle and Lower Cambrian clastics and carbonates which unconformably overlie Proterozoic quartzite and shale (see accompanying diagram). The rocks are broadly folded along northeast trending axes that plunge gently to the southwest.

Mineralization is generally restricted to a 200 foot thick vuggy Lower Cambrian dolomite (Unit LЄd) which is underlain by thin bedded limestone and shaly dolomite and overlain by a thin horizon of purple shaly dolomite (see accompanying diagram). It generally consists of disseminated honey yellow to light grey fine-grained sphalerite. Accessory marcasite and pyrite also occur in amounts varying from a few per cent to about 10 per cent, usually filling vugs in the dolomite and occasionally occurring as thin fracture fillings. The best mineralization is found in areas of most intense brecciation. The dolomite unit is best mineralized over a length of slightly more than 2,000 feet along both sides of a northeast flowing creek. It outcrops locally in three areas and chip channel sampling of these showings in 1974 returned the following assay values:

Showing	Stratigraphic thickness (ft)	Zn %	Pb %	Ag oz/ton
No. 1	59	8.10	0.46	1.16
No. 2	135	1.11	0.14	0.12
No. 3	25	2.22	0.16	0.18

Current Work and Results:

During the summer of 1975, the property was subjected to 1,328 feet of diamond drilling in four holes (BQ core). Lead-zinc mineralization was encountered in all four holes and selected assay results from the best mineralized zones encountered in drilling are presented below:

DDH	Interval (ft)	Zn %	Pb %	Ag oz/ton
F 1	180-185	2.10	-	-
F 2	125-145	6.04	1.46	0.69
F 3	215-230	1.69	1.27	0.36
F 4	115-150	1.70	0.16	0.40

Drilling results showed that the 200 foot section of FLUNK dolomite is weakly mineralized with sphalerite over a length of at least 1,400 feet.

IGOR
Ogilvie Joint Venture
c/o Archer, Cathro and Associates Limited

Copper, Uranium
106 E 2
(65°03'N 134°38'W)

References: Norris et al (1963); Norris (1975); Blusson (1976).

Claims: IGOR 1-24

Location and Access:

The claims lie five miles northeast of Wind River and 20 miles south of Margaret Lake in the Wernecke Mountains. Access is by fixed wing from Mayo to a base camp at Kiwi Lake, 12 miles north of the claims and thence by helicopter.

History:

The IGOR claims were staked in 1974 by Ogilvie Joint Venture, a consortium of Chevron Standard Limited, Marietta Resources International Limited, Aquitane Company of Canada Limited and L. and H. Clay. Preliminary geological mapping and soil sampling were carried out in 1974.

Description:

The claims are underlain by a sequence of metavolcanic and metasedimentary rocks (Unit HO, Norris, 1975) of Proterozoic age. Copper mineralization is found in fine-grained banded metavolcanics associated with magnetite, hematite and barite.

Current Work and Results:

In 1975, geological mapping, a soil geochemical survey for Cu and U, and a broadband scintillometer survey outlined an area of copper mineralization some 1,500 feet long and 500 feet wide. The copper occurs as chalcopyrite associated with hematite and magnetite and the best outcropping area assayed 2.5 per cent copper across 10 feet. Uranium mineralization occurs in minor quantities in narrow discontinuous veins cutting the metavolcanics. No specific area of interest for uranium was outlined.

YOGI
Great Plains Development Company
of Canada Limited

106 E 2
(65°09'N, 134°44'W)

Reference: Norris (1975).

Claims: YOGI 1-16

Location and Access:

The property is located in Illtyd Creek, about 115 miles north of Mayo and 15 miles southwest of Margaret Lake. Access is provided by float plane to Margaret Lake and from there by helicopter to the property.

History:

The claims were staked in summer 1974 as a result of a reconnaissance stream sediment geochemical program and adjoin the FLUNK group to the west.

Description:

The property is underlain by complexly folded and faulted clastic rocks of the Helikian HO unit (Norris, 1975).

Current Work and Results:

During the summer of 1975, the property was geologically mapped at a scale of one inch = 1,060 feet. In addition, a soil geochemical survey for Pb, Zn, Cd was conducted along generally north-south trending elevation contours. soil samples were collected at 200 foot intervals over a total line length of about 45,000 feet, but only sporadic, isolated anomalies were determined.

GREMLIN
Cyprus Anvil Mining Corporation

Copper
106 E 2
(65°11'N, 134°38'W)

Reference: Norris (1974).

Claims: GREMLIN 1-12

Location and Access:

The property is located 10 miles west of the Bonnet Plume River and 10 miles south of Margaret Lake, about 120 miles north of Mayo. Access is provided by float plane to Kiwi Lake (local name for lake 8 miles south-southwest of Margaret Lake), about 1 mile to the north.

History:

The claims were staked during August 1975, as a follow-up on a Cu geochemical anomaly determined by a regional stream sediment geochemical program.

Description:

The property is underlain by Helikian clastic rocks consisting of complexly folded and faulted black shale, sandstone, and conglomerate. Two types of mineralization are present:

(1) Most of the copper is in veins of siderite-barite-pyrite and chalcopyrite and a chip sample from one assayed 1.33 per cent copper over a 21 foot interval.
(2) Massive and heavily disseminated pyrite in conglomerate and sandstone with one chip sample assaying 0.53 per cent copper over 38 feet of pyritic conglomerate and another chip sample assaying 0.29 per cent copper and 0.8 ounces of silver per ton over 10 feet of massive pyrite.

In addition, traces of cobalt as erythrite are present with the best assay at 0.09 per cent Co from a grab sample of vein material.

Current Work and Results:

During 1975, work consisted of preliminary geochemical soil sampling for Cu, Pb, Zn along both banks of the creek at 200 foot intervals for a distance of about 3,000 feet. Values were consistently anomalous in copper along both banks for about 2,500 feet. A company geologist recommended further work which included detailed soil geochemistry along contour lines, detailed geological mapping and hand trenching.

CLOE Cyprus Anvil Mining Corporation Limited	Zinc 106 E 2 (65°12'N, 134°42'W)

Reference: Norris (1975).

Claims: CLOE 1-12

Location and Access:

The property is located 10 miles west of the Bonnet Plume River and 10 miles southwest of Margaret Lake, about 120 miles north of Mayo. Access is provided by float plane to Kiwi Lake (local name for a lake 8 miles south-southwest of Margaret Lake) and from there by helicopter to the property, about 3 miles to the west.

History:

The claims were staked in summer 1975 as a follow-up on a Pb-Zn geochemical anomaly determined by a regional stream sediment geochemical program.

Description:

The property is underlain by black fissile shale of Helikian age. Mineralization consists of float boulders of brecciated black shale cemented by dark brown to black sphalerite. A narrow fault breccia with some secondary zinc mineralization also outcrops on the property.

Current Work and Results:

During 1975, a geochemical soil sampling program for Cu, Pb and Zn was conducted along lines parallel to the main creeks on the claim group. Soil samples were collected at 500 foot intervals along a total line length of over 15,000 feet. Two Pb-Zn anomalies were determined and recommendations for further work included geochemical surveys along grids and contour lines.

JEANETTE Great Plains Development Company of Canada Limited	106 E 2 (65°09'N, 134°48'W)

Reference: Norris (1975).

Claims: JEANETTE 1-15

Location and Access:

The property is located on Illtyd Creek, about 115 miles north of Mayo and 15 miles southwest of Margaret Lake. Access is provided by float plane to Margaret Lake and from there by helicopter to the property.

History:

The claims were staked during summer 1974 as a result of a reconnaissance stream sediment geochemical program in the Bonnet Plume area, and adjoin the FLUNK group to the east.

Description:

The property is underlain by sandstone and shale of the Backbone Ranges Formation which are overlain by limestone, dolomite and shale of the Sekwi Formation. The units dip gently to the southwest and are displaced approximately 500 feet by a major northwest-trending fault.

Current Work and Results:

During summer 1975, geological mapping of the property was undertaken at a scale of one inch = 1,060 feet. In addition, a soil geochemical survey for Pb, Zn and Cd was performed along two elevation contours. Samples were taken at approximately 250 foot intervals for a total line length of about 9,000 feet, but only sporadic anomalies were determined with the survey.

WINDY
Great Plains Development Company
of Canada Limited

106 E 2
(65°11'N, 134°53'W)

Reference: Norris (1975).

Claims: WINDY 1-14

Location and Access:

The property is located on Illtyd Creek, about 115 miles north of Mayo and 15 miles southwest of Margaret Lake. Access is provided by float plane to Margaret Lake and from there by helicopter to the property.

History:

The claims were staked during summer 1974 as a result of a reconnaissance stream sediment geochemical program, and adjoin the FLUNK group to the south.

Description:

The property is underlain by clastics and carbonates of Lower Cambrian age that dip gently to the southwest.

Current Work and Results:

During the summer of 1975, the property was geologically mapped at a scale of one inch = 1,060 feet. In addition, a soil geochemical survey was conducted along several elevation contours for Pb, Zn and Cd. Soil samples were collected at 200 foot intervals along a total line length of about 25,000 feet, but only sporadic, small anomalies of limited interest were determined.

Doll Creek South*
Amax Exploration Inc.

Lead, Zinc
106 E 14
(65°58'N, 135°25'W)

Reference: Norris et al (1963).

Claims: TUKU 1-16; ALI 1-10

Location and Access:

The property is in the southern Richardson Mountains, nine miles north of Doll Creek and 164 miles north of Mayo. Access is provided by float-equipped aircraft from Mayo to an unnamed lake 10 miles northwest of the property or from Moose and Davis lakes 28 miles northwest of the property and from there by helicopter to the property.

History:

The claims were staked in June and July 1974 to cover lead-zinc showings discovered as a result of a follow-up prospecting on a stream sediment geochemical anomaly obtained during a reconnaissance program in 1974. Work in 1974 consisted of preliminary mapping, prospecting and sampling.

Description:

The property covers Lower Cambrian micritic limestone overlain by Middle Cambrian limonitic siltstone, the former locally uplifted to form a north-trending window about 3,000 feet by 12,000 feet in size. To the north and west, the window of micrite is in fault contact with the siltstone. It consists mainly of light to dark grey weathering micritic limestone with occasional vuggy and organic horizons.

Mineralization on the property consists of scattered showings of galena, barite and hydrozincite along fractures within light grey, vuggy micritic limestone. The main showing consists of disseminated and massive galena, sphalerite, minor chalcopyrite and pyrite with associated barite and siderite in a north-trending zone of fault breccia. A creek is localized along the fault and breccia on either side of the creek indicates a fault zone width of approximately 70 feet. Within the fault zone, the main showing is about 12 feet wide by 300 feet long and one continuous chip sample assayed 3.0 per cent lead, 6.4 per cent zinc over a 12-foot interval. Another assay across a 17-foot interval of well fractured, light grey micrite returned 0.24 per cent lead and 0.16 per cent zinc.

Current Work and Results:

During 1975, the property was covered by detailed geological mapping at a scale of 1 inch = 400 feet. In addition, a soil geochemical survey for Mo, Cu, Ni, Co, Mn, Fe, Ag, Zn and Pb was conducted along four east-west traverse lines across the fault zone. The lines cover a 4,000 foot length along the fault zone and samples were collected at intervals of 150 to 250 feet. Anomalous zinc and lead values encountered over the eastern portion of the lines were attributed to scattered local mineralization. No further work was recommended on the property.

YUK
Great Plains Development Company
of Canada Limited

106 F 4
(65°05'N, 133°55'W)

Reference: Norris (1975).

Claims: YUK 1-20

Location and Access:

The property is located about 125 miles north of Mayo and 26 miles southeast of Margaret Lake. Access to the property is provided by float plane to Margaret Lake and from there by helicopter to the property.

History:

The claims were staked during summer 1974 as a result of a reconnaissance stream sediment geochemical program in the Bonnet Plume area.

Description:

The property is underlain by complexly folded and faulted sedimentary rocks of the H2 unit (Norris, 1975) and the Katherine Group.

Current Work and Results:

During summer 1975, the property was geologically mapped at a scale of 1 inch = 1,060 feet and partially covered by a soil geochemical survey along two elevation contours. Soil samples were taken at 400-foot intervals along a total length of 33,000 feet and analysed for Pb, Zn and Cd. No marked anomalies were obtained over two black micrite units. Further geochemical sampling was recommended to better evaluate the anomalous limestone units.

KEN
Great Plains Development Company
of Canada Limited

Zinc
106 F 4
(65°09'N, 133°52'W)

Reference: Norris (1975).

Claims: KEN 1-4

Location and Access:

The property is located on Rapitan Creek, 22 miles southeast of Margaret Lake and 130 miles north of Mayo. Access to the property is provided by float plane to Margaret Lake and from there by helicopter to the property.

History:

The claims were staked in summer 1974 as a follow-up on a reconnaissance stream sediment geochemical program in the Bonnet Plume area.

Description:

The property is underlain by limestone and argillite which have been complexly folded and faulted. Mineralization consists of sphalerite and hydrozincite as partial fracture and vug in-fillings in a brecciated grey micrite. One grab sample assayed 8.0 per cent zinc, while a chip sample across 16 feet of the mineralized zone assayed 1.9 per cent zinc.

Current Work and Results:

During the summer of 1975, the property was geologically mapped at a scale of 1 inch = 200 feet and a soil geochemical survey was conducted for Pb, Zn and Cd. Samples were collected along north-south trending lines spaced 200 feet apart, at 100-foot intervals for a total length of 7,000 feet. The survey showed a small anomalous zinc-rich area near the showing. A trench about 16 feet long was cut into the limestone breccia to further expose the mineralization. The company geologist concluded that the mineralization did not extend laterally, but did rècommend short hole diamond drilling to determine the nature of the mineralization at depth.

VUG	Zinc, Lead
Cyprus Anvil Mining Corporation	116 A 9
	(64°34'N, 136°17'W)

Reference: Green (1972).

Claims: VUG 1-40

Location and Access:

The property is located ten miles south of the Hart River and 68 miles north of Mayo. Access in 1975 was provided by fixed wing aircraft to Worm Lake and the remaining ten miles northwest to the property by helicopter.

History:

The claims were recorded in July 1975 to cover showings discovered as a result of a regional geochemical stream sediment anomaly.

Description:

The property is underlain by a Helikian sequence consisting of a lower unit of shale and argillite with quartzite interbeds overlain by several units made up predominantly of orange-weathering dolomite. The general trend of the units is east-west with a steep dip to the south.

All known mineralization occurs in orange-weathering, thick to massive bedded, dark to light grey dolomite. It commonly consists of sphalerite, galena and white sparry dolomite as a matrix within a tectonic breccia zone in the dolomite.

Current Work and Results:

During summer 1975, the property was subjected to geological mapping (1 inch = 1,320 feet) and geochemical soil sampling for Cu, Pb and Zn. Approximately 300 soil samples were taken along contour lines at intervals of several hundred feet. All anomalous areas coincided with areas of bedrock or float lead-zinc mineralization. Company geologists recommended further work consisting of sampling, prospecting and mapping.

JANE
Great Plains Development Company
of Canada Limited

116 H 6
(65°17'N, 137°14'W)

Reference: Norris (1975).

Claims: JANE 1-32

Location and Access:

The claims are located in the Ogilvie Mountains, about 130 miles north of Mayo, and 36 miles southwest of the junction of the Peel and Hart Rivers. Access to the property is provided by fixed wing aircraft to nearby lakes (Margaret Lake) or the Dempster Highway and from there by helicopter.

History:

The claims were staked in 1974 during a program of geochemical reconnaissance in the Bonnet Plume area.

Description:

The property is underlain by steeply-dipping interbedded units of limestone and shale and is thought to form the south-dipping limb of a large regional anticline. Fossil evidence indicates several of the units to be Upper Ordovician in age. No mineralization was encountered in outcrop.

Current Work and Results:

During summer 1975, a program of geological mapping (1 inch = 1,060 feet), stream sediment and soil geochemical sampling was conducted. Soil samples were taken at 200-foot intervals along lines 400 to 500 feet apart, parallel to elevation contours, and were analysed for Zn, Pb and Cd. Several high zinc anomalies near a shale-limestone contact were determined and it was recommended that a few exploratory Winkie diamond drill holes be drilled to test the anomalies.

DAWSON MINING DISTRICT

ML
Amoco Canada Petroleum Company Limited

Lead, Zinc
106 L 4
(66°08'N, 135°50'W)

References: Norris *et al* (1963); Sinclair *et al* (1975).

Claims: ML 76, 78, 80, 82, 84, 86, 88, 107-120 inclusive

Location and Access:

The property lies roughly 175 miles north of Mayo, two miles west of Doll Creek. Access in 1975 was by fixed wing aircraft from Mayo or Dawson to Kiwi Lake or to local lakes such as Caribou Lake or a small lake on Doll Creek, and thence by helicopter to the property.

History:

The ML claims were staked in June 1974 following a regional stream geochemical program. Work in 1974 consisted of geological mapping and geochemical silt and soil sampling. As a result of this work, the claim block was reduced from 118 to 21 claims.

Description:

The claims are underlain by Cambrian limestone exposed as a window in surrounding Silurian-Devonian rocks. Some galena is associated with a sinkhole in the limestone.

Current Work and Results:

In 1975, the claims were geologically mapped at a scale of 1 inch to 400 feet and covered by a bedrock geochemical sampling program.

Doll Creek North
Amax Exploration Incorporated

Lead, Zinc
106 L 4
(66°08'N, 135°54'W)

References: Norris *et al* (1963); Sinclair *et al* (1975).

Claims: RAS 1-12, TUS 1-12

Location and Access:

The property is located in the southern Richardson Mountains, three and one half miles west of the headwaters of Doll Creek and 175 miles north of Mayo. Access is by fixed wing aircraft from Mayo to one of several nearby lakes and then by helicopter to the property.

History:

The claims were staked during the 1974 field season as a result of follow-up prospecting on a geochemical stream sediment anomaly. Work in 1974 consisted of geological mapping, prospecting and sampling.

Description:

The property straddles a northwest striking fault which separates westerly dipping, Upper Cambrian cherty limestone and fine-grained clastic rocks on the west from flat lying Lower Cambrian micritic limestone, east of the fault.

Mineralization consists of minor pyrite, galena and sphalerite in small vugs and fractures within Lower Cambrian micrite.

Current Work and Results:

During summer, 1975, the property was subjected to detailed geological mapping (1 inch to 1,000 feet) and prospecting. No further work was recommended by company geologists.

PETE
Texasgulf Inc.

Zinc, Lead
106 L 4
(66°11'N, 135°53'W)

Reference: Norris et al (1963).

Claims: PETE 1-6, 9-24, 51-58, 70-77, 100-107

Location and Access:

The claims are located about 180 miles northeast of Dawson and are accessible from there by helicopter.

History:

The claims were recorded in July 1974. Subsequent to evaluation work on the property, the claims were abandoned by Texasgulf.

Description:

The property is underlain by a window of Lower Cambrian micrite which contains sparsely disseminated galena and sphalerite. Concentrations of lead and zinc mineralization are found along open fracture systems and within permeable limestone units adjacent to these fracture systems. The main showing is about 300 feet long and consists of colloform smithsonite and galena with fault breccia and highly fractured micrite. The fault trends 030° and veinlet of white calcite with accessory galena occur within the micrite.

Current Work and Results:

In 1975, most of the claim group was geologically mapped at a scale of 1 inch to 1,320 feet. In addition, several of the claims were covered by a program of geochemical soil sampling (PETE 1, 2, 9, 10, 11, 12). However, the mineralization proved to be local in nature and the property was abandoned.

WON
Kerr Addison Mines Limited

Copper, Molybdenum
115 I 13
(62°52'N, 137°56'W)

Reference: Tempelman-Kluit (1974a).

Claims: WON 1-24, 79-90, 101-118

Location and Access:

The claims straddle an east-flowing tributary of Black Creek, roughly 18 miles west-northwest of Fort Selkirk in the Dawson Range. Access in 1975 was by helicopter.

History:

The original WON claims were staked in October 1973 and June 1974. The current WON 1-24 claims were staked in August 1975 to cover ground which had been staked earlier but which had lapsed. Surface exploration including some test pitting was carried out in 1974.

Description:

Regional mapping has indicated that the property is generally underlain to the east by Triassic volcanics which include altered andesite and basalt and related pyroclastics. To the west, the volcanics are intruded by Triassic granodiorite, locally foliated due to alignment of mafic minerals.

Current Work and Results:

Six diamond drill holes totalling 1,861 feet were drilled on the property early in the 1975 field season. Two of the holes intersected massive to finely laminated, green to black chlorite schist carrying disseminated and fracture-controlled pyrite and traces of chalcopyrite. The remaining four holes all encountered biotite granodiorite. The fresh granodiorite is grey, medium-grained, equigranular and contains less than 1 per cent pyrite and traces of chalcopyrite, disseminated and in fractures. The granodiorite has undergone some alteration locally and in one section there is complete alteration of the feldspar to clay minerals (kaolin?) and sericite. This section of argillic alteration contains pyrite and minor chalcopyrite disseminated and in quartz veinlets, and minor amounts of molybdenite in quartz veinlets and hairline fractures. Later in the summer, an IP survey was carried out on the property.

LUCKY JOE
Rio Tinto Canadian Exploration Limited

Copper, Molybdenum
115 O 11, 12
(63°35'N, 139°30'W)

Reference: Bostock (1942).

Claims: B 1-16; SUNEP 1-14, 18-34; BJB 1-17; ASH 1-44; PAX 1-10

Location and Access:

The claims are situated near the headwaters of Lucky Joe Creek, approximately 30 miles south of Dawson and 6 miles east of the Yukon River. Access in 1974 was by helicopter from Dawson. In addition, a 22 mile long unimproved tote road extends from the mouth of Quartz Creek south to the centre of the property.

History:

The B claims were staked in the summer of 1970 by Silver Standard Mines Limited who carried out soil sampling, geological mapping and trenching during the same year. Work on the property in 1970 consisted of 422 feet of AX diamond drilling in three holes. In spring 1975, the property was optioned by Rio Tinto Canadian Exploration Limited, who staked additional claims, the SUNEP, BJB, ASH and PAX groups, peripheral to the B claim group, and extending to the northwest.

Description:

The property is underlain mainly by Yukon Group metasediments including biotite schist, quartz-muscovite schist and amphibolite (Unit E, Bostock, 1942). The metasediments are enclosed to the east and west by bodies of gneissic granite (Unit A, op. cit.) which is exposed on the west and northwest portions of the claim groups. Chalcopyrite and pyrite with minor amounts of molybdenite occur as disseminations and in fractures parallelling foliation in biotite and quartz-muscovite schists below an amphibolite horizon

Current Work and Results:

In 1975, work by Rio Tinto on the property included geological mapping, soil sampling, geophysical surveys and two diamond drill holes totalling 1,400 feet.

Detailed geochemical soil sampling for Cu, Mo, Pb and Zn was undertaken on the B and SUNEP claims at 50 metre intervals on lines 100 metres apart. Coincident copper and zinc anomalies were outlined which terminated abruptly to the south.

A ground magnetic survey on the B and SUNEP claims outlined a zone of poorly magnetic rocks coincident with the geochemical anomaly. Induced polarization was also carried out on the two claim groups

The diamond drilling on the B claims is reported to have encountered some sections of disseminated chalcopyrite, pyrite, and minor molybdenite in Yukon Group schists.

URA
Beach Gold Mines Limited

Uranium
115 P 13, 14
(63°47'N, 137°32'W)

References: Lang (1952); Bostock (1964).

Claims: URA 1-200

Location and Access:

The URA claims straddle Clear Creek, east of the Stewart Crossing-Dawson highway and roughly 60 miles east-southeast of Dawson. A tractor road from Mile 47.8 on the Stewart Crossing-Dawson highway to placer workings on upper Clear Creek cuts across the northeast corner of the claim group. Additional road-building was carried out in 1975 to provide access to the central part of the property and the areas of the anomalous radioactivity.

History:

The presence of allanite and monazite in gold placer deposits on Clear Creek has been known for some time and was first reported by Lang (1952). Bostock (1964) also reported the presence of allanite in porphyritic syenite from the Syenite Range north of Clear Creek. In 1966, an area of anomalous radioactivity in the Clear Creek area was discovered by a Whitehorse prospector, George Karens, who staked the RUSS claims. Airborne and ground radiometric surveys carried out in 1969 and 1970 outlined several areas of anomalous radiation exceeding 0.6 milliroentgens per hour. The claims were subsequently allowed to lapse and were restaked in March 1975 as the URA claims for Beach Gold Mines Limited.

Description:

The area is generally underlain by quartz-biotite-sericite schist and gneiss of the Yukon Metamorphic Complex (Unit 4, Bostock, 1964) which are intruded by granitic rocks of Jurassic and/or Cretaceous age (Unit 14, op. cit.). The granitic rocks on the URA claims consist of coarse-grained, porphyritic granite, with large tabular phenocrysts of Carlsbad-twinned albite and locally up to 20 per cent tourmaline, in crystals measuring up to 2 cm long. One of the areas of above-background radioactivity consists of an elongate anomaly on the north side of Clear Creek near its confluence with Henry Creek. The second anomaly is situated on the north side of Clear Creek about one and one-half miles upstream.

Current Work and Results:

A ground radiometric survey totalling fifty line-miles was carried out in 1975 using a four-channel gamma ray spectrometer. Results of the survey showed uranium counts in excess of 20 counts per second, four to five times above normal background, in the areas of previously defined radioactivity. Four diamond drill holes, totalling 945 feet, cored in the area of the two anomalies encountered mainly porphyritic granite.

HOT	Zinc, Lead
Cyprus Anvil Mining Corporation	116 A 13
	(64°59'N, 137°46'W)

References: Green (1972); Sinclair *et al* (1975).

Claims: HOT 1-44

Location and Access:

The claims are located about five miles north of Michelle Creek in the central Ogilvie Mountains, 80 miles northeast of Dawson and 110 miles northwest of Mayo. Access is by helicopter from the Dempster Highway, 13.5 miles to the west.

History:

The claims were staked in June, 1974 to cover lead and zinc silt geochemical anomalies discovered earlier in the season. Work in 1974 included preliminary geological mapping, prospecting and hand trenching.

Description:

The property is underlain by intensely folded, thinly bedded, orange to buff weathering argillite, shale and quartzite of Proterozoic age (Unit 1, Green, 1972) unconformably overlain by grey, massive bedded limestone and dolomite of Ordovician and Silurian age (Unit 8, Green, 1972). All the lead-zinc mineralization is contained within the younger carbonates which underlie most of the property. They are gently folded into a major east-west trending anticline.

Mineralization consists of smithsonite with minor galena, sphalerite and pyrite within brecciated grey sparry dolomite. The main showing is a more or less continous zone of mineralized breccia float about 6,000 feet long and 10 to 15 feet wide, which extends in an east-west direction and occurs in the northern portion of the claim group. A fault zone is proposed as the main control for mineralization because of the linear trend and brecciated nature of the mineralization. Channel samples from three trenches across this zone gave the following assays:

Trench Length (ft)	Ag. oz/ton	Pb %	Zn %
15	0.12	0.19	1.18
35	0.06	0.13	0.52
12	1.76	3.98	7.32

In the southern portion of the claim group, several small mineralized zones occur at the same bedding horizon, but there is no continuity between them.

Current Work and Results:

During summer 1975, work consisted of detailed geological mapping (1 inch to 760 feet), geochemical soil sampling along contours and trenching. A total of 286 soil and silt samples were collected at approximately 250 ft. intervals along two contour lines situated around the base and halfway up the mountain slope and analysed for Cu, Pb, Zn. All the determined anomalous zones are contained within or downslope from soils overlying Unit 8. Two trenches were extended and one new trench was dug, all on the main showing. Because the main showing is thought to be related to a zone of faulting, any further mineralization is likely to be narrow in width and erratic in grade. No further work was recommended.

KIWI
Cyprus Anvil Mining Corporation Limited

Zinc, Lead
116 B 10, 15
(64°45'N, 138°45'W)

References: Green (1972); Sinclair *et al* (1975).

Claims: KIWI 1-80

Location and Access:

The property is located in the southern Ogilvie Mountains, 15 miles southwest of Chapman Lake (mile 74) on the Dempster Highway, and 52 air miles north-northeast of Dawson. Access is by helicopter from Dawson or from one of the helicopter pads on the Dempster Highway.

History:

The claims were staked in July and September, 1974 to cover lead and zinc mineralization and associated geochemical anomalies discovered during a reconnaissance program in the 1974 season. During 1974, hand trenching, prospecting and a soil geochemical survey indicated potentially economic lead-zinc mineralization and further work was recommended for 1975.

Description:

The property lies at the eastern end of Coal Creek Dome, an uplifted elliptical dome of Proterozoic shale and carbonates unconformably overlain by Ordovician and younger sediments. The rock units trend from east to southeast with variable dips and the host rock for mineralization on the property is mainly a light grey weathering, massive bedded dolomite (Unit 2c, Green, 1972).

Pb-Zn mineralization occurs at three sites within an area about 3,000 feet long. The main showing is about 25 feet wide and consists of smithsonite anglesite and minor galena exposed within a fault breccia zone which is parallel to the major Seela Pass fault to the south. A channel sample from a 35 foot long trench across the zone gave the following assay: 3.41 oz Ag/ton, 16.26% Pb, 19.75% Zn, 0.05% Cu. Smithsonite fills joints and fractures in the surrounding massive grey dolomite and a grab sample of the 'barren-looking' dolomite from the southern 9 feet of the trench gave the following assay: 0.18 oz Ag/ton 1.50% Pb, 0.90% Zn and 0.01% Cu.

The second showing consists of a zone of breccia float a few hundred feet north of the main showing. Boulders of coarsely crystalline galena were encountered in pits dug in the area. The third showing consists of a mineralized zone up to 10 feet wide which trends in an easterly direction parallel to the Seela Pass fault.

Current Work and Results:

During summer 1975, detailed geological mapping (1 inch = 400 feet) and a soil geochemical survey were conducted along a north-south grid over the central portion of the claim group. Soil samples were collected on the 4,200 foot by 6,000 foot grid at 100 foot intervals along lines generally spaced 400 feet apart and analysed for Cu, Pb, An. The geochemical anomalies coincided with the three known zones of mineralization. In addition, nine trenches and several pits were dug in the mineralized breccia zones. Further work consisting of additional trenching and sampling of the main showing was recommended.

OZ
Cyprus Anvil Mining Corporation Limited

Zinc, Lead
116 B 12, 13
(64°45'N, 139°45'W)

References: Green (1972); Sinclair et al (1975).

Claims: OZ 1-81

Location and Access:

The property is located in the southern Ogilvie Mountains, six miles northeast of Mount Harper and 47 miles north of Dawson. Access is by helicopter from Dawson or Clinton Creek, 38 miles to the south, which is the nearest road point.

History:

The claims were staked in July, 1974 following a regional geochemical stream sediment sampling program. Work in 1974 consisted of preliminary prospecting, geological mapping and geochemical soil surveys on the central claims in the group.

Description:

The property is underlain by a sequence of clastic sediments of Proterozoic age, consisting of orange and buff-weathering dolomite, shale, grey-weathering dolomite and lesser amounts of quartzite, limestone and conglomerate (Unit 2, Green, 1972). Sphalerite and galena occur in veins and breccia zones in dolomite and shale.

Current Work and Results:

In 1975, work consisted of grid geochemical soil sampling, geological mapping and 1,245 feet of diamond drilling (BQ core). Three drill holes were completed but no significant mineralization was intersected. Further work, consisting of hand trenching and detailed geological mapping, was recommended.

DEM
Hudson Bay Exploration and
Development Company Limited

Zinc, Lead
116 B 12, 13
(64°45'N, 139°49'W)

Reference: Green (1972).

Claims: DEM 1-42

Location and Access:

The property is located on a tributary of Coal Creek, approximately 45 miles northwest of Dawson City in the Ogilvie Mountains. Access by the company in 1974 was provided by the Dempster Highway to Chapman Lake and from there by helicopter to the property, a distance of 45 miles.

History:

The claims were staked in August, 1974 following a reconnaissance geochemical stream sediment and prospecting program.

Description:

The property is underlain by southeasterly trending units of dolomite, shale and argillite of Proterozoic age, (Unit 2b, Green, 1972) which dip moderately to the southwest. Locally, folding and faulting are common and the sequence is intruded by narrow diabase dikes. Mineralization on the property consists of trace malachite, chalcopyrite, galena and hydrozincite in diabase, quartz-carbonate fracture infillings and local patches of dolomite breccia.

Current Work and Results:

During the summer of 1975, the property was subjected to geological mapping (1 inch = 1,000 feet), geochemical soil sampling and prospecting.

OD
Union Miniere Explorations and Mining Corporation Limited

Zinc, Lead
116 B 13
(64°49'N, 139°38'W)

Reference: Green (1972).

Claims: OD 1-18

Location and Access:

The claims are situated about 12 miles north-northwest of Mount Harper and 30 miles west of Caldwell Lake. Access is by helicopter from Mile 68 on the Dempster Highway, a distance of 36 miles.

History:

The claims were staked in August 1975.

Description:

The claims are underlain by a sequence of Proterozoic clastic sediments and stromatolitic dolomites.

Current Work and Results:

Six coincident Pb-Zn geochemical soil anomalies were found. Further work was recommended.

TART
Cyprus Anvil Mining Corporation

Zinc, Lead
116 B 13
(64°50'N, 139°53'W)

Reference: Green (1972).

Claims: TART 1-80

Location and Access:

The property is located about 10 miles north of Mount Harper and is accessible by helicopter from Dawson, 55 miles to the south-southeast.

History:

The claims were staked in October 1974.

Description:

The property is underlain by a grey dolomite unit of Helikian age and the mineralization consists of sphalerite, marcasite and minor galena as void fillings in breccia zones within the dolomite.

Current Work and Results:

In 1975, the property was covered by detailed geological mapping at a scale of 1 inch to 400 feet. In addition, a geochemical soil sampling program was conducted over all the claims. Samples were collected at 100 and 200 foot intervals along lines spaced 400 and 800 feet apart. A diamond drilling program consisting of 4 holes (BQ core) for a total footage of 1,623 feet was undertaken on TART #8 and TART #23. The diamond drilling failed to intersect zinc mineralization of economic grades.

ID
Union Miniere Exploration and
Mining Corporation Limited

Copper, Zinc
116 B 13
(64°50'N, 139°45'W)

Reference: Green (1972).

Claims: ID 1-10, 17-25, 61-67, 69-72

Location and Access:

The claims are located 22 miles west of Kit Lake and 12 miles north-northeast of Mt. Harper, at an elevation of 4-6,000 feet. Access is by helicopter from Mile 68 on the Dempster Highway, a distance of 38 miles to the east.

History:

The claims were staked in July 1975.

Description:

The claims are underlain by a thick sequence of Proterozoic and younger sediments. The basal sequence consists of interbedded shales, conglomerates and dolomitic quartzites. These are overlain by a sequence of shales and siltstones with minor quartzite. To the north, these rocks are overlain by younger dolomites.

Current Work and Results:

A soil geochemical survey was conducted for copper, zinc, silver and cobalt. Several areas with anomalous copper and zinc values were found and further work is recommended.

OG
Hudson Bay Exploration and
Development Company Limited

Lead, Zinc
116 B 13, C 16
(64°50'N, 140°00'W)

Reference: Green (1972).

Claims: OG 1-72

Location and Access:

The property, located on a tributary of Coal Creek in the Ogilvie Mountains is about 50 miles northwest of Dawson. In 1974, access was by helicopter from Chapman Lake on the Dempster Highway, a distance of about 50 miles to the east.

History:

The claims were staked in August 1974 following a reconnaissance stream sediment geochemical and prospecting program.

Description:

The property is underlain by Unit 2b of Green (1972), a conglomerate containing pebbles of jasper, chert and quartzite which grades upward into finer grained rocks, principally buff weathering dolomite, but including some shale and argillite, all of Proterozoic age. Mineralization consists of galena and sphalerite within a carbonate sequence, including some breccia. It is poorly exposed on the surface and the extent of mineralization is not defined.

Current Work and Results:

In 1975, the property was geologically mapped and geochemically soil sampled. In addition, an induced polarization survey was carried out on a 6,400 foot by 5,000 foot grid. Measurements were taken at 100 foot intervals along lines spaced 200 feet apart for a total length of 18.4 miles. Two main anomalies parallel to the trend of the rocks were determined, and 12 diamond drill holes (BQ core), totalling 6,451 feet, were collared. The drilling encountered some mineralization in a breccia which may be fault related.

KIM
Hudson Bay Exploration and
Development Limited

Zinc, Lead
116 B 14
(64°46'N, 139°05'W)

Reference: Green (1972).

Claims: KIM 1-24

Location and Access:

The property is located approximately 50 miles north of Dawson City and 22 miles west of Chapman Lake in the Ogilvie Mountains. Access in 1974 was via the Dempster Highway to Chapman Lake and from there by helicopter to the property.

History:

The claims were staked in July 1974 following a reconnaissance stream sediment geochenical and prospecting program. Work in 1974 consisted of geological mapping and a geochemical soil and bedrock sampling program on a grid 1,000 feet by 5,000 feet. Samples were collected at 100 foot intervals along section lines at 200 feet and 400 feet spacings and were analysed for Pb, Zn, Ag. A broad lead-zinc anomaly was determined.

Description:

The property is underlain by shale, argillite and dolomite of Proterozoic age, (Units 1, 2b of Green, 1972) which are host to minor galena and sphalerite mineralization.

Current Work and Results:

In 1975, the property was subjected to further geological mapping and geochemical soil sampling. However, no significant anomalies were determined.

CLINTON CREEK MINE
Cassiar Asbestos Corporation Limited

Asbestos
116 C 7
(64°27'N, 140°42'W)

References: Green and Godwin (1964, pp. 19-21); Green (1965, pp.25-27; 1966, pp. 25-26); Christian (1966); Findlay (1967, pp. 27-29; 1969a, pp. 31-32; 1969b, pp. 18-20); Craig and Laporte (1972, pp. 30-31); Green (1972, pp. 143-144); Craig and Milner (1975, pp. 14-15); Sinclair and Gilbert (1975, pp. 29-30); Sinclair et al (1975, pp. 72-73).

Claims: 147 claims

Location and Access:

The Clinton Creek Mine is 50 miles northwest of Dawson and can be reached by a 26-mile, all-weather road from Mile 33 of the Sixtymile-Boundary Road. Asbestos fibre is shipped by truck to Whitehorse, a distance of 390 miles, and then by rail to the port of Skagway.

History:

The property was staked in 1957 and brought into production 1967.

Description:

The Clinton Creek asbestos deposits occur in serpentinized ultrabasic rocks (Unit E, Green, 1972) associated with metamorphic rocks of the Nasina series (Unit A, op. cit.). The asbestos fibre occurs almost entirely as cross-fibre veinlets, one quarter inch or less in width.

Current Work and Results:

A total of 1,407,453 tons of ore were milled in 1974 at a daily rate of 5,118 tons. Production was mainly from the Porcupine ore body and, to a lesser extent, from the Snowshoe ore body.

OPERATING SUMMARY, 1973-1975

	1975	1974	1973
Tons milled	1,407,453	1,388,248	1,247,154
Rate (tons/day)	5,118	4,596	4,838
Grade (% recovery)	5.85	4.37	5.64
Reserves (probable)	4,773,000	6,524,725	7,861,123
(possible)	928,931	461,000	8,792,000

UG
Cyprus Anvil Mining Corporation

Lead, Zinc
116 C 16
(64°51'N, 140°02'W)

Reference: Green (1972).

Claims: UG 1-32

Location and Access:

The property is located about 10 miles north-northwest of Mount Harper and is accessible by helicopter from Dawson, 57 miles to the south-southeast.

History:

The claims were staked in June 1975.

Description:

The property is underlain by dolomite of Helikian age. Mineralization consists of galena and sphalerite disseminated with breccia occurrences which are probably related to a steeply dipping fault.

Current Work and Results:

In 1975, the property was covered by geological mapping at a scale of 1 inch to 1,320 feet. In addition, a soil geochemical survey was conducted along contour lines over all claims. The geological mapping suggested that the mineralized showings are limited in extent and no more work was planned for the property at present.

KEPT
Union Miniere Explorations and Mining Corporation Limited

Zinc. Lead
116 F 2
(65°11'N, 140°59'W)

Reference: Norris *et al* (1963).

Claims: KEPT 1-12, 15-16

Location and Access:

The claims are situated 1 1/2 miles south of Cathedral Creek along the Alaska-Yukon border in the Ogilvie Mountains approximately 95 miles northwest of Dawson. Access during 1975 was by helicopter from the base camp at Mile 68 on the Dempster Highway, a distance of approximately 80 miles.

History:

The claims were staked in June 1975.

Description:

The claim group is underlain by grey limy dolomites and stromatolitic dolomites, with few outcrops of grey-black argillites.

Current Work and Results:

Two narrow, coincident, Pb-Zn geochemical soil anomalies trending east-west were found and further work was recommended.

DOLL
Amoco Canada Petroleum Company Ltd.

Lead, Zinc
116 I 1
(66°05'N, 136°05'W)

Reference: Norris *et al* (1963).

Claims: DOLL 1-79

Location and Access:

The property is located 165 miles north of Mayo and 30 miles east of the Dempster Highway. Access is provided by wheeled fixed-wing aircraft to Mile 204 on the Dempster Highway or by float plane to Margaret Lake and from these points by helicopter to the property.

History:

The claims 1-24 were staked in July 1974 following a reconnaissance geochemical stream sediment survey in the Richardson Mountains. In May, 1975 48 additional claims were staked and added to the group along with 7 fractional claims staked in June, 1975.

Description:

The property is underlain by limestone and shale of Ordovician and Silurian age. Mineralization consists of galena and sphalerite in limestone breccia. The northern portion of the property has mainly lead occurrences whereas the southern portion has both lead and zinc.

Current Work and Results:

Work in 1974 consisted mainly of preliminary stream and soil geochemical sampling. During summer 1975, a detailed soil geochemical survey for lead, zinc was conducted over 40 miles of grid lines. Soil samples were collected at 100-foot intervals along lines spaced 400 feet apart. Two main lead anomalies were determined with dimensions of 800 feet by 1,600 feet and 400 feet by 2,000 feet. The remainder of the lead anomalies are typically narrower and shorter while the zinc anomalies are much more irregular and difficult to correlate.

Most of the lead anomalies have been found to be directly related to minor lead and zinc mineralization in turbidite type breccias and tectonic-calcite vein breccias. A gravity survey was performed over some of the larger anomalies.

LLOD
Amoco Canada Petroleum Company Ltd.

Lead
116 I 1, L 4
(66°03'N, 136°00'W)

References: Norris et al (1963); Sinclair et al (1975).

Claims: LLOD 1-32

Location and Access:

The property is located 165 miles north of Mayo, and 30 miles east of the Dempster Highway. Access is provided by wheeled fixed-wing aircraft to Mile 204 on the Dempster Highway or by float plane to Margaret Lake and from these points by helicopter to the property.

History:

The claims LLOD 1-8 were staked in August, 1974 following a regional stream geochemical program. Subsequently, an additional 24 claims were staked in May, 1975. In 1974, work consisted mainly of preliminary stream and soil geochemical sampling.

Description:

The property is covered by extensive overburden and little outcrop is exposed. It is believed to be underlain by limy sediments, commonly thinly interbedded and made up of limestone breccia sequences, chert horizons and minor thin shale beds. The rock units trend east of north and are gently folded.

Current Work and Results:

During summer 1975, the property was subjected to a comprehensive soil geochemical survey for Pb, Zn. Samples were collected at 100 foot intervals along 24 lines spaced 400 feet apart for a total line length of about 27 miles. Several narrow elongate Pb anomalies were determined, but it was concluded that they corresponded to dolomitized limestone breccia similar to that on the DOLL group.

Mount Davies Gilbert Iron Formation
Welcome North Mines Limited
and Bethlehem Copper Corporation Limited

Iron
117 A
(68°30'N, 136°30'W)

Reference: Young (1972).

Claims: DELTA 1-48; DAWN 1-48

Location and Access:

The claims are located about 80 miles west of Inuvik and 88 miles northwest of Fort McPherson. Access to the area is provided by float-equipped, fixed wing aircraft to lakes within the claim area.

History:

The claims were staked in May 1974 by Welcome North, as a result of information released by F.G. Young (1972) concerning stratigraphic studies between the Blow and Fish rivers. A joint venture was entered into in June 1974 between Welcome North Mines Limited and Bethlehem Copper Corporation Limited.

Description:

The property is underlain by rocks of Early Cretaceous age consisting mainly of bedded ironstone and shale, deformed into broad open folds with gently dipping limbs (Young, 1972).

The mineralization consists of fine grained quartz-siderite iron formation which is part of the bedded ironstone and shale sequence. Over a strike length of 18 miles from Cache Creek to Mount Davies Gilbert, the ironstone-shale member varies from 2,800 to 700 feet thick locally in the Cache Creek, Fish Creek, and Rapid Creek areas.

Current Work and Results:

Preliminary geological mapping and bedrock chip sampling were conducted in August 1974 on sections from the Fish River and Rapid Creek areas about 13 miles apart.

In the Fish River area, bedrock chip samples of quartz siderite were selected along 50 foot lengths over a total slope length of 580 feet (true thickness about 360 feet). In addition, several 25 foot representative sample lengths of quartz siderite were taken from the Rapid Creek area. Averaged assay values are presented below:

	Total Fe%	SiO_2%	Al_2O_3%	Mn%	P%	L.O.I%
Fish River area (16 samples)	20.5	29.6	8.1	2.2	2.1	14.7
Rapid Creek area (5 samples)	16.7	36.7	8.1	0.73	3.0	10.1

In addition, numerous metallurgical tests were performed on a sample from the Rapid Creek area. The fine grained sample consisted of major amounts of siderite and quartz with minor lazulite and light green unknown mineral. The tests were regarded as largely inconclusive, though direct reduction using hydrogen was regarded as offering the greatest promise for iron recovery.

WHITEHORSE MINING DISTRICT

* - Properties visited by W.D. Sinclair unless otherwise indicated.

SM
El Paso Mining and Milling Company

Lead, Zinc
105 C 13
(60°58'N, 133°46'W)

Reference: Mulligan (1963).

Claims: SM 1-8

Location and Access:

The claims lie 48 miles east-northeast of Whitehorse between Slate and Red Mountain creeks. Access in 1975 was by float plane to Rosy Lake, 8 miles south of the property, and thence via helicopter.

History:

The property was originally staked prior to 1935 and subsequently re-staked in 1946 and 1966. In 1968, Boswell River Mines Limited conducted stream sediment geochemical sampling. The property was staked in 1973 as the HM claims by El Paso, and in 1974 as the SM claims by W. Kuhn.

Description:

The property is underlain by argillite, talc-chlorite-sericite schist and minor thin limestone bands assigned to the Big Salmon Complex of Mississippian age or earlier (Unit 1, Mulligan, 1963). These rocks have been anticlinally folded about a northwest-trending axis and are intruded locally by what appears to be a lamprophyre dyke. Northeast of the property boundary, the rocks of the Big Salmon Complex are intruded by a northwest-trending dyke of dacite porphyry (Unit 14,, op. cit.); to the southwest, they are bounded by quartz-hornblende gneiss (Unit A, op. cit.) trending northwest.

Two mineral occurrences have been reported, both in brecciated argillite cemented by carbonate. One consists of a two-inch, contorted vein of galena; the other consists of a white efflorescence of zinc (hydrozincite?).

Current Work and Results:

Work in 1975 consisted of geological mapping, soil and rock geochemical sampling and a VLF-EM survey. A number of areas anomalous in lead, zinc and silver were outlined, three of which were generally coincident. The VLF-EM survey failed to outline any significant anomalies.

BUG
R.G. Hilker

Molybdenum, Copper
105 C 13
(60°59'N, 133°46'W)

References: Bostock (1957); Lees (1936); Mulligan (1963).

Claims: BUG 1-16

Location and Access:

The claims are situated on Red Mountain at an elevation of 4,500-5,000 feet. Access is by helicopter from Whitehorse, 50 miles to the southwest. There is a tote trail from Mile 26 on the South Canol Road to Red Mountain.

History:

The claims were staked and drilled in 1969 by Boswell River Mines which subsequently allowed the claims to lapse in 1970. They were restaked by prospector J.B. O'Neill in 1970 but then lapsed in 1975; the property was restaked by R.G. Hilker in June 1975.

Description:

The claims are underlain by variety of rock types including gneisses, amphibolite, schist, greenstone, and limestone intruded by the felsic plutonics of the Coast Intrusions and Tertiary and volcanic dykes. The molybdenum mineralization is associated with these felsic and porphryitic dykes.

Current Work and Results:

A brief geological examination of the property was made by a consulting geologist.

ARCTIC MINE
Arctic Gold and Silver Mines Limited

Gold, Silver
105 D 2
(60°05'N, 134°42'W)

References: Cairnes (1906, pp. 24-25; 1908, p. 14; 1917, pp. 28-36; in Bostock, 1957, pp. 209-217; 245-275; 426-459); Cockfield and Bell (1926, p. 39; 1944, p. 12); Wheeler (1961, p. 127); Green (1966, pp. 55-60); Findlay (1967, pp. 46-47; 1969a, pp. 58-60; 1969b, pp. 35-37); Craig and Laporte (1972, pp. 117-118).

Claims: PRIDE OF THE YUKON, CARIBOU, PEERLESS 1, 3, 5-9

Location and Access:

The property is situated 46 miles south of Whitehorse on Sugarloaf Hill about 1 mile north of Montana Mountain summit. The main workings are at elevations over 5,000 feet and are accessible by an 8.6-mile road from Carcross 6 miles to the north.

History:

The property is an old one which dates back to at least the early 1900's. Underground development was carried out between 1905 and 1912 and approximately 3,000 tons of handpicked ore grading 1.08 ounces per ton gold and 27.7 ounces per ton silver were reportedly shipped from the property prior to 1915. Work from 1965 to 1968 included the driving of adits on two levels, the 800 level at 5,400 feet elevation and the 700 level at 5,275 feet, and extensive underground exploration and development on these two levels. At the end of 1967, ore reserves were announced as 254,920 tons averaging 0.68 ounces per ton gold and 19.70 ounces per ton silver. Production from the mine began in May 1968 and terminated October 1969 having produced a total of 7,635 ounces of gold and 207,225 ounces of silver from 55,943 tons of ore milled.

Description:

Two principal vein systems striking northeast cut altered granodiorite host rock. The veins consist of individual veins up to 3 feet across and series of veins over widths up to 8 feet. The veins vary from flat-lying to dipping 30° to 45° to the northeast. Massive lenses and shoots of pyrite, arsenopyrite, sphalerite and galena with rare chalcopyrite with varying amounts of quartz make up the principal vein minerals. Argentite and freibergite have also been reported.

Current Work and Results:

From July to October, up to 5 men were employed in re-opening the 700 level adit. Work consisted mainly of de-icing the portal and retimbering as well as mapping and sampling of the veins. The mine was shut down for the winter in October.

TUB
R.G. Hilker

Copper, Molybdenum
105 D 6
(60°20'N, 134°05'W)

References: Wheeler (1961); Craig and Milner (1972, p. 44).

Claims TUB 1-10

Location and Access:

The property is on the north side of the Watson River, two miles southeast of Alligator Lake and 27 miles southwest of Whitehorse. Bush roads extend west from Robinson, on the Carcross Road to the property. Access is usually by helicopter from Whitehorse.

History:

The claims were part of the former WAT, SON and RIV groups of Phelps Dodge Corporation (M.I.R., 1971-72) and were staked in June 1975 by R.G. Hilker.

Description:

The property is underlain by biotite granodiorite of the Coast Intrusion (Unit 8, Wheeler, 1961). Shear zones containing copper and molybdenum mineralization are found on the property but pyrite is the cause of the gossan found on the property.

Current Work and Results:

The property was examined briefly by a consulting geologist.

Whitehorse Copper Mines Limited

Copper, Silver, Gold
105 D 10, 11
(60°33'N to 60°45'N,
134°53'W to 135°10'W)

References: Kindle (1964); Green and Godwin (1964, pp. 33-39); Green (1965, pp. 40-41; 1966, pp. 50-51); Findlay (1967, pp. 41-43; 1969a, pp. 49-54); Hilker (1967); Craig and Laporte (1972, pp. 110-111); Sinclair and Gilbert (1975, pp. 74-76); Sinclair et al (1975, pp. 142-143).

Claims: Approximately 700 claims in the Whitehorse Copper Belt

Location and Access:

The properties are located along a north- to northwest-trending belt, up to four miles wide and 20 miles long, lying west of Whitehorse. Access to the property is provided by various mine roads connected to the Alaska Highway. Copper concentrates are shipped by rail to Skagway.

History:

Copper showings in the Whitehorse area were known at least as early as 1897 and most of the known occurrences were staked in the period 1898 to 1899 by miners enroute to the Klondike. Some production took place up to 1920 and subsequent exploration on the Copper Belt included diamond drilling by Richmond Yukon Company Limited in 1927 and Noranda Exploration Company Limited in 1947 and 1948.

In 1955, Imperial Mines and Metals commenced exploration in the area and started drilling on the Best Chance prospect in 1956. In 1957, the company was renamed New Imperial Mines Limited. By 1965, the company had outlined roughly 4.6 million tons of ore grading 1.17 per cent copper and milling began in 1967. Since then, there has been production from six open pits: Little Chief, Arctic Chief East and West, Black Cub, Keewenaw and War Eagle.

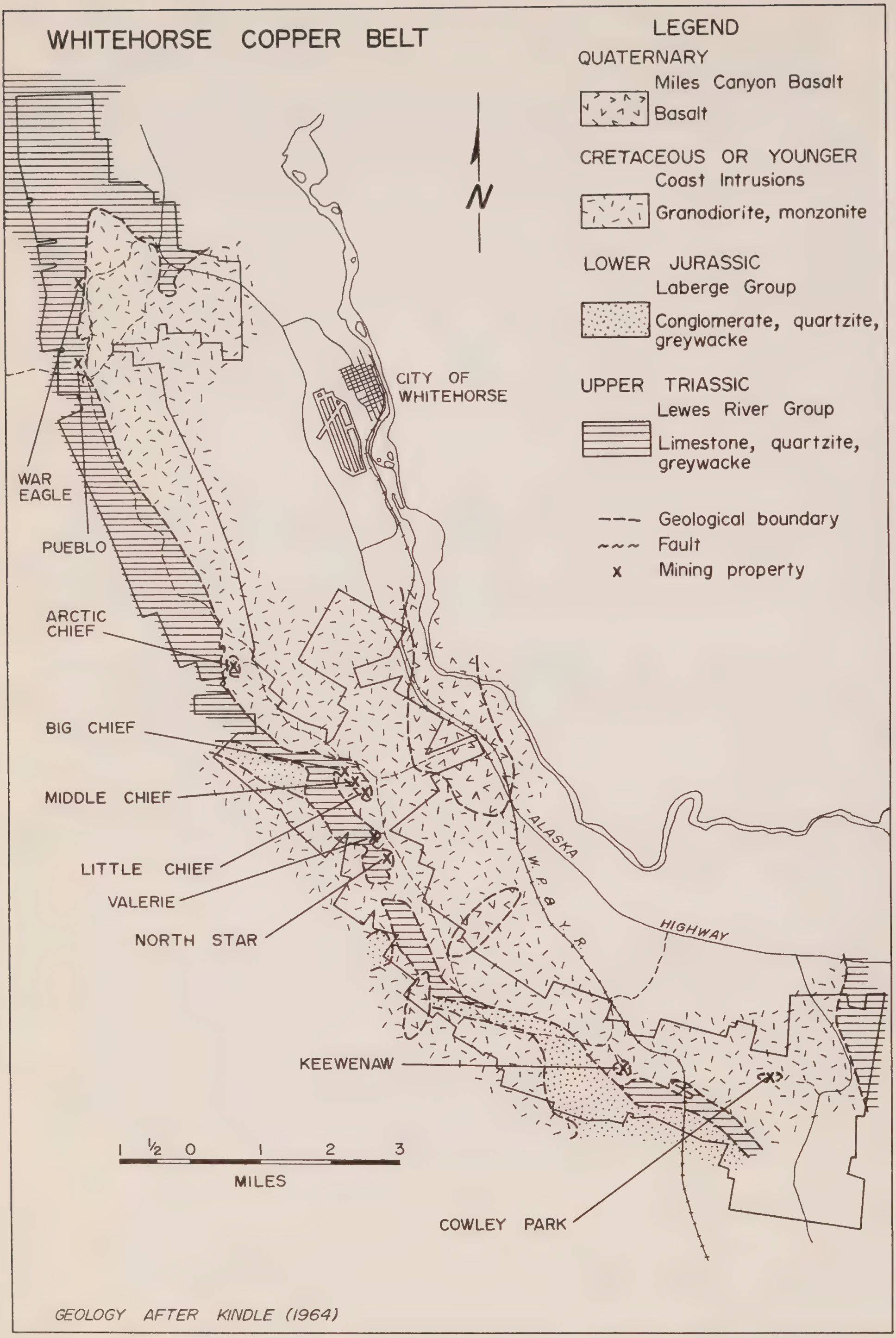
Production was suspended in June 1971 due to low metal prices and was resumed in December 1972 from underground mining of the Little Chief ore body. The company was renamed Whitehorse Copper Mines Limited in September 1971.

Description:

Copper occurrences of the Whitehorse Copper Belt are in calc-silicate-magnetite skarns developed along the irregular contact between Triassic Lewes River sediments (Unit 3c, Wheeler, 1961) and Cretaceous granodioritic to dioritic intrusions of the Coast Intrusions (Unit 8, op. cit.). The skarns are best developed in massive limestone of the Lewes River Group and consist of varying amounts of diopside, epidote, tremolite-actinolite, garnet, serpentinite, magnetite and/or hematite and, occassionally, asbestos. The primarily ore minerals are bornite and chalcopyrite with minor amounts of chalcocite and native copper. Valleriite, a relatively rare copper sulphide, is locally abundant but mill recovery is poor because of its physical properties.

Current Work and Results:

Production in 1975 was 737,062 tons grading 1.52 per cent copper, mainly from the Little Chief ore body. The ore also contained an average of 0.3 ounces of silver per ton and 0.025 ounces of gold per ton.


WHITEHORSE COPPER BELT
LEGEND
QUATERNARY
Miles Canyon Basalt
Basalt
CRETACEOUS OR YOUNGER
Coast Intrusions
Granodiorite, monzonite
LOWER JURASSIC
Laberge Group
Conglomerate, quartzite, greywacke
UPPER TRIASSIC
Lewes River Group
Limestone, quartzite, greywacke
Geological boundary
Fault
x Mining property
N
CITY OF WHITEHORSE
WAR EAGLE
PUEBLO
ARCTIC CHIEF
BIG CHIEF
MIDDLE CHIEF
LITTLE CHIEF
VALERIE
NORTH STAR
KEEWENAW
COWLEY PARK
ALASKA
HIGHWAY
W. P. & Y. R.
1 ½ 0 1 2 3
MILES
GEOLOGY AFTER KINDLE (1964)

OPERATING SUMMARY, 1973-1975

	1975	1974	1973
Tons Milled	737,062	626,541	700,054
Rates (tons/day)	2,030	1,745	1,919
Grade (%Cu)	1.52	1.84	1.83
Reserves (tons),	3,054,897	3,567,980	3,182,388

Surface exploration on the Whitehorse Copper Belt included diamond drilling on several properties. One hole, 213 feet long, was drilled on the Cowley Park property to test a magnetic low and encountered Miles Canyon basalt. In addition to bulldozer trenching and ground magnetic survey, two holes totalling, 996 feet were drilled on the North Star property. Hole No. 1, drilled on a magnetic anomaly, intersected dioritized and skarnified quartzite with pyrite. Hole No. 2, 500 feet away, was drilled on an I.P. anomaly and encountered up to 1,000 feet of serpentine skarn and minor limestone. One 2-foot section from the second hole assayed 7.4 per cent zinc and 2.5 per cent copper. The company plans to carry out more drilling on the North Star property in 1976. On the Valerie property, one hole drilled to a depth of 871 feet failed to intersect significant mineralization. A ground magnetic and an I.P. survey were conducted on the WE claims in the northern part of the Copper Belt and the company plans to test the results of these surveys with diamond drilling in 1976.

In addition to the exploration by Whitehorse Copper Mines, Hudson Bay Exploration and Development Company Limited carried out extensive I.P. and magnetic surveys on the northern portion of the Copper Belt under their joint venture agreement.

GROUSE (KREFT-TAKACS)*
Whitehorse Copper Mines Limited

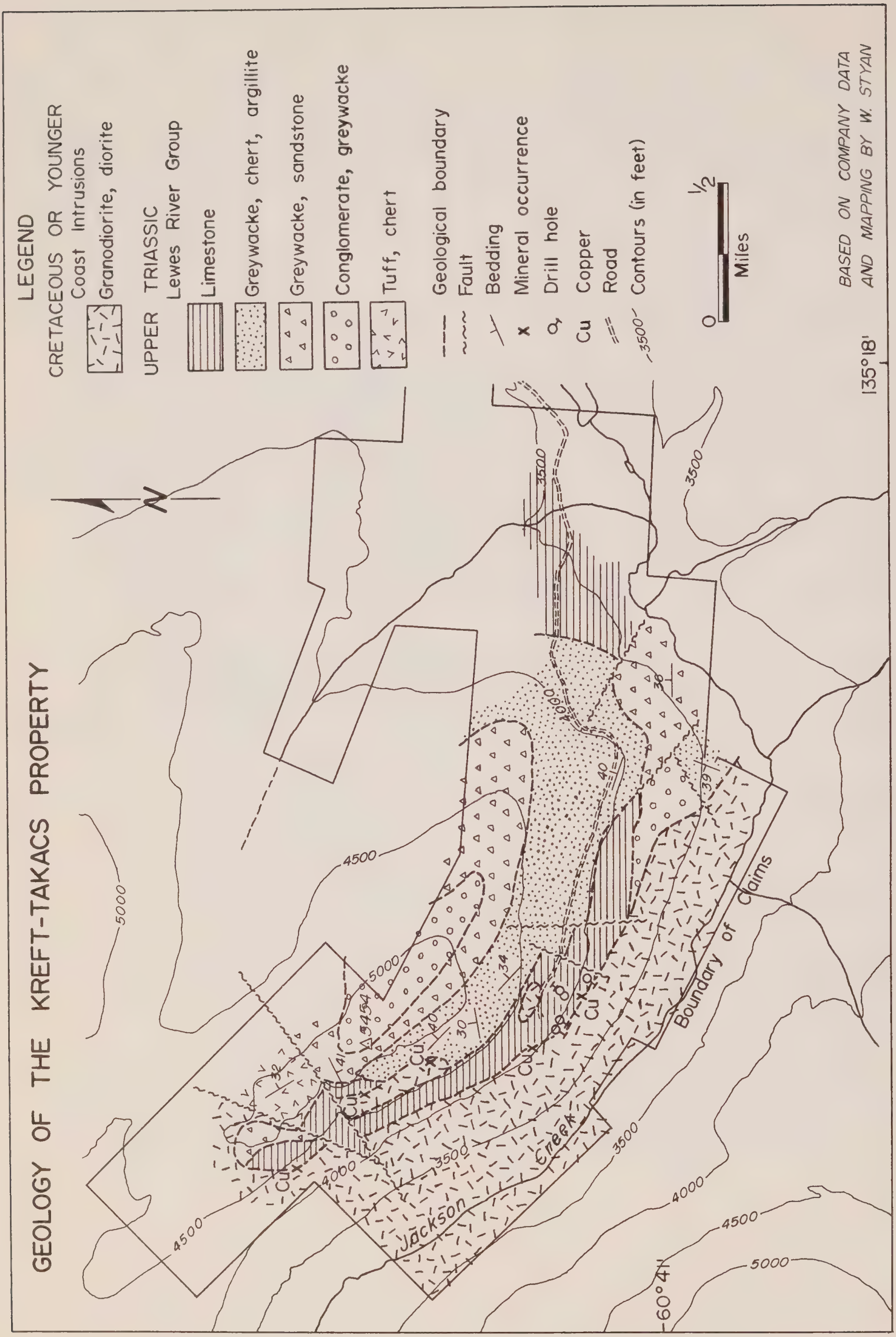
Copper
105 D 11
(60°41'N, 135°22'W)

References: Wheeler (1961); Craig and Milner (1975, p. 52); Sinclair et al (1975, pp. 143-144).

Claims: GROUSE 1-16; ROY 1-8; WOLF 1-6; LUNAR 1-8; APEX 17-18, 23-24; PANTHER 1; GEAR 1-6; JAKE 1,2

Location and Access:

The property is situated on the north side of Jackson Creek roughly two miles west of Franklin Lake and 11 miles west of Whitehorse. The topography in the area is generally steep and elevations range from 3,200 to nearly 5,500 feet. Access to the property is provided by a summer tote road from the Fish Lake-Jackson Creek road.


GEOLOGY OF THE KREFT-TAKACS PROPERTY
LEGEND
CRETACEOUS OR YOUNGER
Coast Intrusions
Granodiorite, diorite
UPPER TRIASSIC
Lewes River Group
Limestone
Greywacke, chert, argillite
Greywacke, sandstone
Conglomerate, greywacke
Tuff, chert
Geological boundary
Fault
Bedding
Mineral occurrence
Drill hole
Cu Copper
Road
3500 Contours (in feet)
0
1/2
Miles
N
BASED ON COMPANY DATA
AND MAPPING BY W. STYAN
135°18'
60°41'
Jackson Creek
Boundary of Claims
5000
4500
4000
3500
5454

History:

Copper mineralization was discovered and staked in 1969 by S. Takacs and E. Kreft. New Jersey Zinc Corporation optioned the property in 1972 and drilled six holes totalling 1,500 feet. Only weak copper mineralization was encountered by this drilling in which the best assay was 0.26 per cent copper. In 1974, the property was optioned by Whitehorse Copper Mines Limited.

Description:

The property is underlain by Upper Triassic Lewes River Group sediments (Unit 3, Wheeler, 1961) intruded by granitic rocks of the Coast Intrusions (Unit 8, op. cit.).

The Lewes River Group sediments consist mainly of greywacke and conglomerate but include chert, argillite and limestone. Cherty tuff occurs locally near the northwestern corner. On the property the conglomerate consists of well-rounded boulders and cobbles of feldspar porphyry, hornblende porphyry and andesite within a matrix of greywacke. Lenses of quartzite occur locally in the conglomerate. The greywacke is grey to dark-grey and varies from fine- to coarse-grained. The coarse-grained greywacke locally contains lenses of conglomerate. Chert, argillite and limestone interbeds occur in the fine-grained greywacke. Massive limestone up to several hundred feet thick varies from white and fine-grained to black, coarse-grained and fossiliferous. The latter is often brecciated and veined by calcite.

The sediments generally strike northwest with dips averaging 30° to 40° but locally up to 80° in the northeast. Steeply-dipping faults striking northwest to north to northeast cut the sediments.

In the southwestern portion of the property along the Jackson Creek valley, the Lewes River Group sediments are intruded by granitic rocks of the Coast Intrusions. The granitic rocks are made up primarily of coarse-grained, porphyritic (plagioclase phenocrysts up to 2 cm) hornblende granodiorite. Small bodies of hornblende diorite also intrude the sediments.

Copper mineralization in skarn occurs sporadically over a distance of two miles along the contact between hornblende granodiorite and massive limestone and limy clastics of the Lewes River Group. Well-developed skarn is concentrated in a massive, grey to white limestone in the centre of the ridge and consists of actinolite, diopside, magnetite and calcite with minor wollastonite, serpentine, chlorite and epidote. Copper mineralization consists of disseminated chalcopyrite with secondary malachite, azurite and chrysocolla. Malachite and minor chalcopyrite have been observed in skarn at several other localities along the granodiorite-limestone contact.

Barren skarn assemblages of diopside, garnet, epidote and minor magnetite occur in thinly interbedded limestone and clastics and in limy clastics. No mineralization was observed in the intrusive rocks themselves.

Current Work and Results:

Six diamond drill holes totalling 1,401 feet were drilled in the central part of the ridge along the granodiorite-limestone contact where the skarn is best developed. The drilling encountered calc-silicate-magnetite skarn up to 80 feet thick developed in limestone at the contact of limestone and quartzite. One hole, drilled at an angle of -55° to the southwest, encountered 20 feet of disseminated and patchy chalcopyrite in actinolite magnetite skarn which assayed 5.60 per cent copper and 7.9 ounces per ton silver. However, another

hole, drilled from the same location at an angle of -80° to the southwest, encountered only 5 feet of 0.29 per cent copper. No significant sections were encountered in four other drill holes. The company plans to continue drilling on the property in 1976.

TILL — 105 D 14
Asarco Incorporated — (60°47'N, 135°26'W)

Reference: Wheeler (1961).

Claims: TILL 1-48

Location and Access:

The claims are situated roughly 12 miles west-northwest of Whitehorse. Access to the property is via a bush road which leaves the Alaska Highway at approximately Mile 932.

History:

The claims were staked in November 1974.

Description:

The claims are largely covered by glacial overburden except in the south-eastern portion of the property where sediments of the Triassic Lewes Group (Unit 3c, Wheeler, 1961) are exposed.

Current Work and Results:

Work on the property in 1975 consisted of limited geological mapping, soil sampling and ground magnetic surveying. Results were negative and the claims were allowed to lapse.

GEE — Copper
United Keno Hill Mines Limited — 105 D 14
(60°56'N, 135°20'W)

Reference: Wheeler (1961).

Claims: GEE 1-4

Location and Access:

The GEE claims are situated nearly six miles west of the Klondike Highway and four miles north of the Takhini Hotsprings. The normal mode of access in 1975 was by helicopter from Whitehorse, 20 miles to the southeast.

History:

The claims were staked in May 1975 to cover copper mineralization discovered during the course of a regional exploration program.

Description:

The property is underlain mainly by Lower Jurassic sediments of the Laberge Group (Unit 4a, Wheeler, 1961) consisiting of argillite, sandstone, limestone pebble conglomerate, chert and shale. These sediments strike roughly north, dip moderately to the east and are cut by several east-trending faults. To the west, the Laberge Group sediments are in contact with Upper Triassic Lewes River Group sediments (Unit 3, op. cit.) along a major, north-striking fault.

Copper mineralization occurs in limestone pebble conglomerate close to the contact of this rock with grey chert. The limestone conglomerate is composed of closely-packed and elongated pebbles of white to grey, microcrystalline limestone with less than 10 per cent dark green, argillaceous matrix. The copper minerals consist of chalcocite and minor malachite and appear to be restricted entirely to the matrix of the conglomerate.

Current Work and Results:

Geological mapping on the property in 1975 suggested that the exposed mineralization was of limited extent and no significant anomalies were detected by soil sampling. Two samples from the mineralized zone gave the following assays:

Sample	Cu. (%)	Ag. (oz/ton)
1	0.83	0.02
2	0.36	0.02

KING LAKE*
United Keno Hill Mines Limited

Copper, Molybdenum
105 D 14
(60°49'N, 135°28'W)

References: Wheeler (1961); Sinclair et al (1975, pp. 144-145).

Claims: KING 1-8; LAKE 1-54; K-L 1, 2

Location and Access:

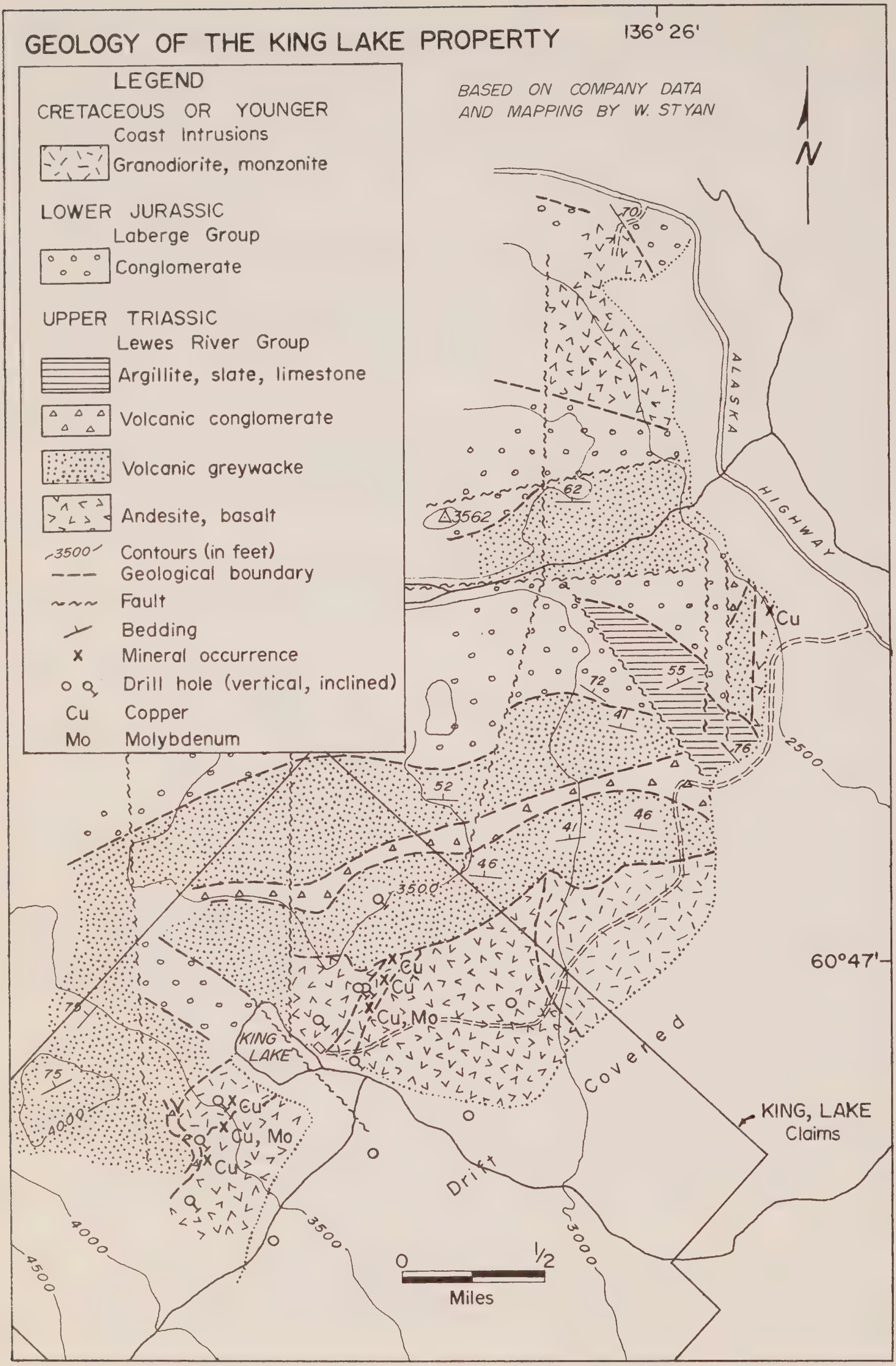
The property lies south of the Alaska Highway roughly 15 miles west-northwest of Whitehorse and can be reached by a 3.1 tote road which leaves the Alaska Highway at Mile 933.9 (Km 1502). Most of the showings are situated near a small lake, locally referred to as King Lake, which is near the centre of the property. The terrain is moderately sloping to steep, with elevations ranging from 2,800 to 5,000 feet.

History:

The KING and LAKE claims were staked by the Suits Brothers of Whitehorse in May 1974 after Joe Suits found copper showings while looking for a cabin site. The property was subsequently optioned by United Keno Hill Mines Limited.

Description:

The area is underlain primarily by volcanics and related sediments of the Upper Triassic Lewes River Group (Unit 3a, Wheeler, 1961), Jurassic Laberge Group sediments (Unit 3aa, op. cit.) and granitic rocks of the Cretaceous Coast Intrusions (Unit 8, op. cit.).


GEOLOGY OF THE KING LAKE PROPERTY
136° 26'
BASED ON COMPANY DATA
AND MAPPING BY W. STYAN
N
LEGEND
CRETACEOUS OR YOUNGER
Coast Intrusions
Granodiorite, monzonite
LOWER JURASSIC
Laberge Group
Conglomerate
UPPER TRIASSIC
Lewes River Group
Argillite, slate, limestone
Volcanic conglomerate
Volcanic greywacke
Andesite, basalt
3500 Contours (in feet)
Geological boundary
Fault
Bedding
Mineral occurrence
Drill hole (vertical, inclined)
Cu Copper
Mo Molybdenum
ALASKA
HIGHWAY
3562
Cu
Cu, Mo
KING LAKE
Covered
Drift
KING, LAKE
Claims
60°47'
0
1/2
Miles
2500
3000
3500
4000
4500

The base of the Lewes River Group in the property area consists of volcanic rocks, including basalt, andesite and minor bands of chert tuff, although massive, fine- to medium-grained andesite predominates. Up to 10 per cent pyrite occurs as disseminations and fracture fillings within the volcanics. The Lewes River Group volcanics appear to lie conformably on altered diorite, of unknown age.

The Lewes river Group sediments consist mainly of greywacke and conglomerate with minor argillite, slate and limestone near the top of the section. The greywacke is white- to grey-weathering, green to grey in colour, medium-to coarse-grained and poorly sorted. The conglomerate is generally massive and poorly sorted with a matrix of grey to green greywacke. The conglomerate contains lenses of greywacke and locally is well-bedded. Granitic fragments in the conglomerate are rare. Minor lenses of dark grey, platy limestone associated with argillite and slate occur locally, probably near the top of the section but stratigraphic relationships are not clear.

The younger Laberge Group conglomerate is thick-bedded and poorly sorted with a gritty, argillaceous matrix. The abundance of granitic fragments help to distinguish it from Lewes River Group conglomerate.

Dykes and sills (?) of coarse-grained, serpentinized gabbro, of uncertain age, intrude altered diorite but not Lewes River Group sediments. Observed mainly in drill core, the serpentinized gabbro varies from feldspar-rich phases composed essentially of pyroxene, now altered to a mixture of serpentine and fine-grained magnetite.

Granitic rocks of the Coast Intrusions intrude altered diorite in two dyke-like bodies on the northeast and southwest sides of King Lake and in a larger stock to the east. The two dyke-like bodies near King Lake, with which all the known mineral showings are associated, consist of quartz monzonite to biotite granodiorite. These rocks are white-weathering, pinkish to grey on fresh surfaces, medium- to coarse-grained and locally porphyritic with pink feldspar phenocrysts up to 6 mm in diameter. They are not highly altered although minor chlorite and epidote alteration is pervasive. Some local kaolinization and silicification was observed in drill core, but is apparently unrelated to any increase or decrease in sulphide mineralization. The granitic stock to the east consists of coarse-grained hornblende granodiorite. The age of the granitic rocks has generally thought to be Cretaceous or younger although some older ages have been reported (Wheeler, 1961). The granitic rocks near King Lake have not been observed intruding Lewes River Group sediments and it is possible they may be older than Upper Triassic.

Basaltic dykes one to two feet wide cut Lewes River Group sediments and are possibly related to Miles Canyon Basalt of Pleistocene age.

The structure of the area is dominated by a broad, northwest-plunging anticline and most of the sediments dip moderately to steeply to the north and northwest. The structure has been modified by faulting, predominantly in a north to northwesterly trend.

Mineral occurrences on the King Lake property have been divided into three types. The first type consists of chalcopyrite and occassionally molybdenite associated with pyrite and magnetite occurring as disseminations and fracture fillings in quartz monzonite. Chlorite, epidote and calcite commonly accompany the sulphide mineralization but the mineralized monzonite generally does not appear to have been noticeably altered. This type of mineralization is most prevalent in the dyke-like body of quartz monzonite

northeast of King Lake where it is present in several small, localized occurrences.

The second type of mineralization consists of chalcopyrite, molybdenite and pyrite in small quartz veins in strongly altered diorite peripheral to quartz monzonite. Scattered occurrences of this type of mineralization are found southwest of King Lake.

Pyrite occurring as disseminations, in fractures and in amygdules in andesitic volcanics northeast of King Lake forms the third type of mineralization. No copper or molybdenum sulphides have been recognized in these volcanics.

Current Work and Results:

Geophysical and geochemical surveys outlined a number of anomalous areas. An I.P. survey, employing a dipole-dipole configuration, outlined 10 anomalies, all but two coincident with magnetic highs. An EM-16 survey also outlined a number of conductive zones, some corresponding with I.P. anomalies. Most of the geophysical anomalies were located on the southeast portion of the claims where till cover obscures the bedrock geology.

Soil sampling failed to outline any major anomalies with the exception of coincident copper and molybdenum anomalies southwest of King Lake believed related to minor copper and molybdenum sulphides in quartz veins. Soil sampling in the southeastern portion of the property was precluded by the thick till cover.

A diamond drilling program totalling 5,056 feet in 14 holes was conducted to test the geophysical anomalies and the copper showings. The drilling indicated the coincident I.P. and magnetic anomalies were caused by serpentinized gabbro containing magnetite. Drilling northeast of King Lake beneath copper showings in the quartz monzonite intersected only minor, localized copper mineralization.

Subsequent to the drilling program, United Keno terminated their option agreement with the Suits Brothers.

ABI
United Keno Hill Mines Limited

Lead, Zinc, Silver
105 D 16
(60°49'N, 134°21'W)

Reference: Wheeler (1961).

Claims: ABI 1-4

Location and Access:

The claims are situated approximately six miles directly south of Mount Byng at elevations of 4,500 to 5,500 feet. Access in 1975 was by helicopter from Whitehorse, 25 miles to the west.

History:

The claims were staked in July 1975.

Description:

The claims lie in an area mapped by Wheeler (1961) as pink quartz monzonite (Unit 9). Mineralization discovered on the property consists of sphalerite and galena with pyrite disseminated in a very fine-grained, white to pink, siliceous shear zone. Manganese oxide staining is evident.

Current Work and Results:

Work on the property in 1975 included geological mapping, soil sampling and hand trenching. Soil sampling outlined some anomalous but discontinuous lead and zinc values and low silver values. Hand trenching in the area of mineralized float failed to indicate the nature of the bedrock source. It appears to be a silicified shear zone up to four feet wide but no strike or dip could be determined and the occurrence appears to be local. Three mineralized samples from the trenching assayed as follows:

Sample	Pb. (%)	Zn (%)	Ag. (oz/ton)
1	1.40	0.44	1.36
2	0.10	0.16	0.14
3	0.08	0.13	0.10

LYNX
Loon Lake Syndicate

Copper, Gold
105 E 1
(61°21'N, 134°11'W)

References: Bostock and Lees (1938); Craig and Laporte (1972, pp. 119-120); Sinclair *et al* (1975, p. 148).

Claims: LYNX 1-16

Location and Access:

The claims lie immediately northwest of Upper Loon Lake, roughly 45 miles northeast of Whitehorse. Elevations on the property range from 3,300 to 4,400 feet. Access in 1975 was by fixed wing aircraft from Whitehorse to Loon Lake.

History:

Copper showings on the property were known prior to 1900 and some development work was carried out in the early 1900's. The property was restaked as the BEAVER and MINK claims in 1969 and as the LYNX claims in December 1972 and May 1974.

Description:

The LYNX claims are underlain by sericite-chlorite schist and cherty quartzite dipping 55° and 75° to the southwest and northwest. Copper showings consist of disseminated chalcopyrite and minor pyrite in quartzite, crudely banded, patchy chalcopyrite and pyrite in schist, and specks of chalcopyrite in quartz veinlets.

Current Work and Results:

Additional geological reconnaissance and soil sampling were carried out in 1975. Some anomalous copper, lead and zinc values were obtained.

HIG | Molybdenum, Copper
United Keno Hill Mines Limited | 105 E 2
(61°01'N, 134°44'W)

Reference: Bostock and Lees (1938).

Claims: HIG 1-22

Location and Access:

The HIG claims are four miles north of Joe Mountain and roughly 11 miles east of Lake Laberge. Access in 1975 was by helicopter from Whitehorse, 25 miles to the southeast.

History:

The claims were staked in June 1975.

Description:

The area is underlain by a stock of pink to grey granodiorite belonging to the Cretaceous Coast Intrusions (Unit 11, Bostock and Lees, 1938). Molybdenite with minor pyrite and traces of chalcopyrite occur in fractures in moderately to highly weathered (and altered?) phases of the granodiorite.

Current Work and Results:

Geological mapping and soil sampling on the property outlined a number of small, erratic and non-coincidental copper and molybdenum anomalies. One sample of the mineralized granodiorite assayed 0.03 per cent copper and 0.098 per cent molybdenum.

LORI | Copper, Molybdenum
D.C. Syndicate | 105 E 2
(61°02'N, 134°43'W)

Reference: Bostock and Lees (1938).

Claims: LORI 1-13

Location and Access:

The claims are situated at the headwaters of Laurier Creek, roughly four miles west of Teslin Mountain. Helicopter was the normal mode of access in 1975.

History:

The claims were staked in June 1975 following reconnaissance exploration in the area.

Description:

The southern part of the property is underlain by granodiorite of the Cretaceous Coast Intrusions (Unit 11, Bostock and Lees, 1938) which intrudes andesitic and basaltic volcanics of the Hutshi Group (Unit 9, op. cit.) to the north. Molybdenite and chalcopyrite are reported to occur in fractures in the granodiorite.

Current Work and Results:

Soil sampling and geological mapping were carried out on the property in 1975.

GEM
D.C. Syndicate

Gold
105 E 6
(61°22'N, 135°06'W)

Reference: Bostock and Lees (1938).

Claims: GEM 1-86

Location and Access:

The claims lie roughly four miles east of the north end of Lake Laberge, on the south side of Povoas Mountain. Access in 1975 was by helicopter.

History:

The staking of the claims in August 1975 was prompted by the discovery of native gold during a reconnaissance exploration program.

Description:

The area is underlain by Mesozoic andesitic and basaltic volcanics (Unit 9, Bosotock and Lees, 1938).

Current Work and Results:

Native gold was discovered in a rhyolite dyke cutting the andesitic and basaltic volcanics during reconnaissance exploration in 1975. Subsequent geological mapping and soil and silt sampling limited this mineralization to the initial discovery.

BOND
D.C. Syndicate

Copper, Molybdenum
105 E 7
(61°25'N, 134°53'W)

Reference: Bostock and Lees (1938).

Location and Access:

The claims are situated three miles north of Miller Creek, roughly 12 miles due east of the north end of Lake Laberge. In 1975 the property was reached by helicopter.

History:

The claims were staked in August 1975.

Description:

The property is underlain by a granodiorite stock of the Cretaceous Coast Intrusions (Unit 11, Bostock and lees, 1938). The granodiorite intrudes Triassic Lewes River Series sediments (Unit 5, op. cit.), Jurassic Laberge Series sediments (Unit 6, op. cit.) and basaltic and andesitic volcanics of the Hutshi Group of Cretaceous age (Unit 9, op. cit). Molybdenite and malachite are reported to occur in fractures in the granodiorite, and chalcopyrite in volcanic float.

Current Work and Results:

Geological mapping and soil sampling were carried out on the property in 1975.

BAND*
D.C. Syndicate

Copper
105 E 13
(61°50'N, 135°31'W)

Reference: Bostock and Lees (1938).

Claims: BAND 1-4

Location and Access:

The claims lie on the west side of Packers Mountain, approximately 30 miles southeast of Carmacks. Access in 1975 was by helicopter.

History:

Copper showings were discovered and staked as the HIJ claims in the early 1970's by United Keno Hill Mines Limited. These showings were restaked as the BAND claims in July 1975 by D.C. Syndicate.

Description:

The property is underlain by argillaceous sediments probably belonging to the Jurassic Laberge Series (Unit 6, Bostock and Lees, 1938) which have been intruded by small stocks of monzonite, diorite and feldspar porphyry belonging to the Cretaceous Coast Intrusions (Unit 11, op. cit.). Chalcopyrite, associated with pyrite and magnetite, occurs in garnet-diopside skarn developed at the intrusive-sediment contacts.

Current Work and Results:

Geological mapping, soil sampling and a ground magnetic survey were carried out on the property in 1975. The highest assays returned from samples of the mineralized skarn ran 0.2 per cent copper and traces of nickel.

AU, BRIE
Utah Mines Limited

Lead, Zinc
105 F 14
(61°51'N, 133°14'W)

Reference: Wheeler *et al* (1960a).

Claims: AU 1-16; BRIE 1-128

Location and Access:

The claims are two miles south of Fox Creek, fifteen miles from the South Canol Road along Fox Creek and 26 miles southwest of the village of Ross River. Access is by helicopter from Ross River on the South Canol Road. There is a winter road along Fox Creek.

History:

The ground was originally staked as the TUB claims in 1971 and some prospecting and geochemistry done by Arrow Inter-America Corporation at that time. The AU claims were staked in January 1975 and the BRIE claims around them in September 1975.

Description:

The property is underlain by a folded series of Cambrian black and grey phyllites. Numerous veins of quartz-carbonate-green mica containing pyrite, chalcopyrite, galena and sphalerite are found.

Current Work and Results:

Prospecting and a geochemical soil and silt survey were carried out. The best mineralization was found in boulders in a stream. Two types of sulphide bearing boulders were found:

1. massive pyrite with some chalcopyrite
2. banded galena and sphalerite in a siliceous matrix.

No geochemical anomalies were found.

MAL, BAR, TENAS
Boliden-Preussag Exploration Limited

105 K 1, 2
(62°02'N, 132°14'W to
62°05'N, 132°28'W)

References: Roddick and Green (1961a); Tempelman-Kluit (1972).

Claims: MAL 1-44; BAR 1-8; TENAS 1-33

Location and Access:

The claims lie north of Ross River along a west-northwest trend in three separate blocks two to six miles apart. The MAL claims are situated roughly one mile south of Olgie Lake which can be used by fixed wing aircraft from Ross River, ten miles to the south. The BAR claims lie two miles east of the MAL claims and can be reached by a bush road which leaves the North Canol Road 3,000 feet east of Tenas Creek. The TENAS claims are roughly six miles south-east of the BAR claims. Access to the TENAS claims is provided by the North Canol Road which crosses the southern corner of the claim group.

History:

All three claim blocks were staked in August 1974 by Welcome North Mines Limited. The properties were subsequently optioned to Boliden-Preussag Explorations Limited early in 1975.

Description:

The claims are situated along a west-northwest trending belt of quartz-sericite schist and phyllite, (Unit 7, Roddick and Green, 1961a), overlain by andesitic volcanics to the south (Unit 8, op. cit.) and intruded to the north by granodiorite of the Anvil Range batholith (Unit 11, op. cit.). The schist and phyllite are thought to be correlative with the phyllite to the west which hosts the massive sulphide deposits of the Anvil Range and which is thought to

be Cambrian or earlier in age (Tempelman-Kluit, 1972). Outcrops are scarce on all the claim groups, particularly the BAR group, and no occurrences of economic minerals have been reported.

Current Work and Results:

Extensive surface exploration undertaken on the property in 1975 included geological mapping, geochemical soil sampling and a Turam electromagnetic survey. The results of this work failed to outline any anomalous areas on either the MAL or BAR claims with the exception of one electromagnetic anomaly near the southwestern corner of the BAR group. On the TENAS claims a number of electromagnetic conductors were outlined in an area underlain by quartz-sericite phyllite. The electromagnetic anomalies were also coincident with anomalous concentrations of lead and zinc in the soil. Late in the year a diamond drilling program was undertaken on the TENAS claims to test the anomalous zones. No significant sections of sulphide mineralization have been reported from this drilling.

TER — 105 K 2
Monore Metals Corporation — (62°06'N, 132°32'W)

Reference: Roddick and Green (1961).

Claims: TER 1-28

Location and Access:

The TER claims lie 10 miles north-northwest of Ross River, immediately southwest of the west end of Olgie Lake. Access in 1975 was by helicopter directly to the property or by float-equipped, fixed-wing aircraft to Olgie Lake.

History:

The TER claims were staked in August 1974.

Description:

Although largely covered by overburden, the property covers an area generally underlain by quartz-sericite schist, banded quartzose granulite and banded skarn (Unit 7, Roddick and Green, 1961). To the west and north these rocks are intruded by Cretaceous granitic rocks (Unit 11, op. cit.). No mineral occurrences have been found on the property.

Current Work and Results:

Field work in 1975 consisted primarily of geochemical soil sampling. The property was not visited.

ANVIL MINE*
Cyprus Anvil Mining Corporation

Lead, Zinc, Silver
105 K 2, 3, 6
(62°21'N, 133°22'W)

References: Chisholm (1957); Roddick and Green (1961a); Green and Godwin (1964, pp. 31-32); Green (1965, pp. 36-37; 1966, pp. 47-50); Findlay (1967, pp. 35-39; 1969a, pp. 43-45; 1969b, pp. 29-30); Tempelman-Kluit (1972); Craig and Laporte (1972, pp. 94-96); Brock (1973); Sinclair and Gilbert (1975, pp. 50-52); Sinclair et al (1975, pp. 128-129).

Claims: FARO, GAL, ED, SUN, RICH, DY, GALE, DEA, LEA, PEA, SEA, SB, DP, KAY, MOR, SINK, LO, TIE, ROCK, BILL: approximately 2,000 claims

Location and Access:

The Anvil Mine is situated 143 miles northeast of Whitehorse in the Anvil Range. Ore concentrates are trucked to Whitehorse via roughly 250 miles of all-weather roads and then transferred to the White Pass and Yukon Route for shipment by rail to Skagway.

History:

The mine was brought into production late in 1969 and, except for brief shutdowns due to labour problems, has been in continuous production since. In 1975, Anvil merged with Dynasty Explorations Limited to form Cyprus Anvil Mining Corporation.

Description:

The host rocks on the property consist of pelitic schist which are overlain by calc-silicate phyllite (Unit 2, Tempelman-Kluit, 1972). The regional trend of the schist and phyllite is to the northwest, with dips averaging 20° to the southwest. Locally, the structure is complex, with at least five stages of deformation recognized by company geologists. The ore occurs in a series of massive sulphide zones along a 6,600 foot strike length. The ore zones are tabular in longtitudinal section and lenticular in cross section and are generally conformable to the enclosing schist and phyllite host rocks. Galena and sphalerite, associated with pyrite and pyrrhotite, are the principal sulphide minerals.

Current Work and Results:

During 1975, 3,225,083 tons of ore were milled at a daily rate of 8,983 tons.

OPERATING SUMMARY - 1973-1975

	1975	1974	1973
Tons Milled	3,225,083	2,925,359	2,899,124
Daily rate (tons)	8,983	8,865	7,942
Mill Heads:			
Lead (%)	9.44)	10.11)	11.25)
Zinc (%)	combined)	combined)	combined)
Silver (oz/ton)	1	1	1
Ore reserves (tons)	46,400,000	49,674,000	52,599,000

Annual Report 1975.

1975 exploration in the vicinity of the mine consisted of 10 diamond drill holes totalling roughly 25,000 feet, with some individual holes up to 2,600 feet long. Results of this work confirmed the existing general structural/stratigraphic models for the mine area. It allowed considerable refinement of metamorphic stratigraphy and specific subdivision of the Faro schist unit. Down dip continuity of Faro #3 ore zone outside the limits of the current ultimate pit design was also demonstrated. Detailed work by Cyprus Anvil geologists continues in an attempt to unravel the internal geometry and stratigraphy of the deposit.

LINDA, JACKIE, RACHEL, EVA, MABLE
BEV, ALICE, WYNNE, IRENE, RAZ, RUTH
Welcome North Mines Limited
Getty Mining Pacific

105 K 2, 5, 6, 7
(62°10'N, 132°42'W to
62°26'N, 135°52'W)

References: Roddick and Green (1961a); Tempelman-Kluit (1972).

Claims: LINDA 1-44; JACKIE 1-64; RACHEL 1-42; EVA 1-47; MABLE 1-48; BEV 1-28; ALICE 1-30; WYNNE 1-36; IRENE 1-56; RAZ 1-20; RUTH 1-42

Location and Access:

The claims are situated in separate blocks in the Anvil Range within a northwest trending strip roughly 40 miles long. Access to the claims was mainly by helicopter from Faro or Ross River.

History:

The greater portion of claims were staked early in 1975; the rest were staked during the following summer.

Description:

The claim groups are all considered to be underlain by schist and phyllite mapped as Unit 3 by Tempelman-Kluit (1972). Locally, the schist and phyllite are intruded by granodiorite of Cretaceous age. No sulphide mineral occurrences have been reported.

Current Work and Results:

Magnetic, electromagnetic and soil geochemical surveys carried out in 1975 outlined a number of anomalous areas on which further work, including diamond drilling, is intended.

KIRK Property
M. Early

105 K 3
(62°01'N, 133°03'W)

Reference: Tempelman-Kluit (1972).

Claims: AL 1-4; KIRK 1-2; RIM 1-6

Location and Access:

The claims are situated at about the 5,500 foot level stradling a Mountain peak some 15 miles south of the town of Faro, in the Buttle Creek area. Access is by helicopter from Faro.

History:

The claims were re-staked in September 1974.

Description:

The claims are underlain by a series of metasediments. (Unit 2, Roddick and Green, 1961).

Current Work and Results:

A gravity survey of the property was conducted to evaluate a previously defined geochemical anomaly but the response was not indicative of massive sulphide mineralization.

SWIM
Kerr Addison Mines Limited
Canadian National Resources

Lead, Zinc, Silver
105 K 3
(62°13'N, 133°02'W)

References: Findlay (1969a, p. 47); Tempelman-Kluit (1972); Sinclair *et al* (1975, p. 134).

Claims: SWIM 1-72

Location and Access:

The property lies immediately northwest of Swim Lake, six miles southeast of the original Vangorda Creek property and 20 miles east of Faro. Access is via the Vangorda-Swim Lakes road.

History:

The SWIM claims were staked by Kerr Addison in 1963 following an airborne magnetic survey. Drilling on the property in 1965 and 1966 outlined a massive sulphide zone containing 5 million tons averaging 9.5 per cent combined lead-zinc and 1.5 ounces per ton silver. The property was optioned in 1974 by AEX Minerals Corporation (now Canadian National Resources) and electromagnetic and gravity surveys were carried out over part of the property.

Description:

The property is underlain by grey phyllite and slaty phyllite of probable Cambrian age (Unit 3, Tempelman-Kluit, 1972). The dominant foliation of the phyllites trends northwest and dips gently northeast.

The Swim deposit is a discontinuous, roughly tabular and elongate mass of sulphides with quartzose gangue enclosed in sericitic and graphitic phyllites. Galena and sphalerite are the main ore minerals and are commonly associated with pyrite, pyrrhotite, marcasite and pyrite. Arsenopyrite, magnetite and tetrahedrite also occur.

Current Work and Results:

In 1975, four holes were drilled totalling 3,460 feet.

HEK
Cyprus Anvil Mining Corporation

105 K 5
(62°22'N, 133°32'W)

Reference: Tempelman-Kluit (1972).

Claims: HEK 1-14

Location and Access:

The claims are situated stradling Rose Creek some 6 miles west of the Anvil minesite. Access was by helciopter from the minesite.

History:

The claims were staked in March 1975.

Description:

The claims are underlain by biotite-muscovite schist, amphibolite and marble (Unit 2, Tempelman-Kluit, 1972) unit of Proterozoic (?) age.

Current Work and Results:

A Turam EM survey was conducted on the claims. Five conductors were located.

SOK
Claymore Resources Limited

Copper
105 K 5
(62°23'N, 133°39'W)

References: Roddick and Green (1961a); Findlay (1969a, p. 45; Tempelman-Kluit (1972).

Claims: SOK 1-29

Location and Access:

The property straddles Rose Creek roughly eight miles west of the Anvil open pit mine. Access in 1975 was by helicopter from Faro, 15 miles to the southeast.

History:

The property was originally staked as the MULTI claims by Anvil Mining Corporation who carried out geochemical and electromagnetic surveys in 1967 and 1968. An I.P. survey carried out in 1967 outlined several anomalous areas, one of which was tested by a 500-foot drill hole in 1968. This drill hole is reported to have intersected interbedded volcanics and graphitic schists. The SOK claims were staked for Claymore Resources Limited in July 1974.

Description:

Although obscured to a large degree by overburden, the property appears to be underlain by andesitic and basaltic volcanic rocks containing minor interbands of phyllite, quartzite and limestone. The volcanic rocks are generally dark-coloured, medium- to fine-grained and schistose although to the south the volcanics are coarse-grained and, locally distinctly tuffaceous or vesicular. The volcanics are thought to be Mississippian or later in age, corresponding to Unit 7 and possibly Unit 8 of Roddick and Green (1961a). Medium- to coarse-grained granodioirte of Cretaceous age (Unit 11, Roddick and Green, 1961a) intrudes the volcanics to the north and west of the property. Several minor occurrences of chalcopyrite, pyrite, pyrrhotite and locally, minor arsenopyrite are associated with the volcanic rocks.

Current Work and Results:

Geochemical soil and silt sampling failed to outline any copper, lead or zinc anomalies and a consultant for the company considered the minor sulphide occurrences too low-grade to warrant further investigation.

BG — 105 K 5
Claymore Resources Limited — (62°24'N, 133°36.5'W)

Reference: Tempelman-Kluit (1972).

Claims: BG 1-16

Location and Access:

The BG claims lie approximatley eight miles west of the Anvil Mine. Normal access in 1975 was by helicopter from Faro, roughly 15 miles to the southeast.

History:

The property was first staked late in 1965 as the FAIR claims but these lapsed and were restaked as part of the CROWN group by Anvil Mining Corporation early in 1967. Work on the claims by Anvil included soil sampling, a Turam electromagnetic survey and a gravity survey. This work is reported to have outlined two small geochemical anomalies and a number of Turam electromagnetic anomalies. The BG claims were staked for Claymore Resources Limited in July 1974.

Description:

Rock exposure is very poor on the BG claims although the area lies generally within the stratigraphic interval which contains the muscovite schist host rocks for the Faro ore bodies to the east. In the northern part of the claim group, strongly foliated schist and phyllite are in contact with andes-

itic and basaltic volcanic rocks. Outcrops of coarse-grained pyroxenite occur in the northeast corner of the property and beyond. No mineral occurrences have been reported on the claims.

Current Work and Results:

Geological mapping, soil sampling and a magnetometer survey carried out over selected areas of the property in 1975 failed to outline any new anomalous areas. The Turam anomalies outlined by Anvil, which were never drilled, may be significant in that the property is underlain by favourable host rock lithologies.

JOE — 105 K 5
Lion Mines Limited — (62°25'N, 133°35'W)

References: Findaly (1969a, pp. 45-46); Tempelman-Kluit (1972).

Claims: JOE 1-8

Location and Access:

The property is roughly 21 miles northwest of Faro. Access in 1975 was by helicopter.

History:

The JOE 1-8 claims were staked in April 1967. During the 1967 season, New Far North Explorations Limited and Consolidated Bellekeno Mines Limited carried out geological, geochemical and magnetic surveys on the property.

Description:

The property is underlain by schists of Cambrian (?) age (Unit 2, Templeman-Kluit, 1972) which are intruded to the north by granodiorite of the Anvil Batholith (Unit 11, op. cit.). Outcrops of ultramafic rocks (Unit 12, op. cit.) are also present on the property. No mineral showings have been reported.

Current Work and Results:

In 1975, Lion Mines drilled a single hole to a depth of 332 feet. The hole intersected mainly biotite schist with finely disseminated pyrrhotite.

TSS — 105 K 5, 6
Teck Corporation Limited — (62°17'N, 133°29'W)
Silver Standard Mines Limited

Reference: Tempelman-Kluit (1972).

Claims: TSS 1-39

Location and Access:

The TSS claims lie four miles northwest of the Faro ore body and can be reached via the access road which leads to the Anvil Mine from the town of Faro.

History:

The property was originally staked in 1965 as the JO claims and in 1966 and 1967, magnetic, electromagnetic and geochemical surveys were carried out by Kim Explorations Limited. The property was restaked as the TSS claims in June 1974.

Description:

The property lies within the belt of Cambrian or older phyllitic rocks which host the massive sulphide ore bodies of the Anvil Range area (Unit 3, Tempelman-Kluit, 1972). Outcrop on the TSS claims, however, is noteably absent.

Current Work and Results:

Bulldozer trenching in 1975 was unsucessful in locating any mineralized phyllite.

DG — 105 K 6
Tay River Mines Limited — (62°13'N, 133°12'W)

Reference: Tempelman-Kluit (1972).

Claims: DG 1-6

Location and Access:

The claims are located approximately one mile east of the Anvil Mine. Access is possible by bush road from the main mine access road.

History:

The claims were staked in August 1974.

Description:

The property is covered with glacial overburden. It has been infered that the claims are underlain by Unit 2 of Tempelman-Kluit in contact with the granite of the Mt. Mye stock.

Current Work and Results:

A geochemical soil survey for lead and zinc was conducted. No anomalous readings were obtained.

GRUM
Kerr Addison Mines Limited
Canadian National Resources

Lead, Zinc, Silver
105 K 6
(62°15'N, 133°10'W)

References: Chisholm (1957); Green and Godwin (1964, p. 31); Tempelman-Kluit (1972); Sinclair *et al* (1975, pp. 130-131).

Claims: GRUM 1-3, 5; CHUCK 1, 2, 5-8; MAC 1, 2; TIM 1-3, 6, 7; FIRTH 6-8; HANK 2-8; SALLY 1-4; WYNNE 6-8; ALICE 1-8; ROCKY 1, 3, 5, 7, 8; ELLAMAY 3, 4; JACK 1-5; BIX 2, 3; CHAMP 1-8: total of 63 claims and fractions

Location and Access:

The property lies roughly five miles northeast of Faro and straddles the Vangorda-Swim Lakes Road which provides ready access.

History:

The property was originally staked and explored in the period 1953-55 at which time two small sulphide zones designated the Champ and Firth were discovered west of the Vangorda deposit. In 1973, AEX Minerals Corporation optioned the property and drilled four holes, one of which intersected a section of massive sulphides carrying lead and zinc. In 1974, Kerr Addison drilled 60 holes totalling 55,784 feet, outlining a massive sulphide zone containing a minimum of roughly 30 million tons of 10 per cent combined lead-zinc and nearly 2 ounces of silver per ton. Late in 1974, AEX Minerals Corporation merged with 79902 Resources to form Canadian National Resources.

Description:

Although outcrop in the immediate area of the deposit is lacking, the property is generally underlain by chlorite-muscovite schist and phyllite assigned to Unit 3 of probable Cambrian age by Tempelman-Kluit (1972). Detailed mapping by Cyprus Anvil geologists in the area of the Faro ore body indicates that the host rocks for the massive sulphides belong to Unit 2 of Cambrian age or older.

The host rocks of the GRUM deposit consist of black, graphitic phyllite and white, sericite-quartz phyllite. The latter has a tendency to form haloes around sulphide zones. These rocks are overlain by green, chlorite-sericite-quartz phyllite and grey, sericite-quartz phyllite which form the hanging wall of the deposit. The footwall rocks consist of biotite-muscovite phyllite, probably in fault contact with underlying garnet-biotite-staurolite schist. The host rocks are characterized by complex internal deformation dominated by pervasive foliation trending northwest and dipping 20° to the southwest.

The deposit is roughly elliptical in shape with a gently northwest-plunging axis over 5,000 feet long and a gently southwest-dipping axis of 1,200 feet. In gross aspect, the deposit appears to be generally conformable to the dominant foliation of the host rocks. The ore zones consist of a series of massive sulphide lenses and mineralized phyllite separated by weakly to non-mineralized host rocks. Individual ore zones vary from a few feet up to 300 feet thick.

The principal ore minerals are sphalerite and galena with minor chalcopyrite, generally associated with pyrite. Minor amounts of pyrrhotite, magnetite and arsenopyrite are present in massive sulphide secions. White barite is in sections of rich ore and appears to increase to the northwest. The massive sulphides tend to be finely banded and very fine-grained, although texture and grain size are variable.

Current Work and Results:

In March, a decline was begun to explore the deposit from underground. The main decline was driven at a grade of 15 per cent and headed northwest for 1,500 feet and then roughly northeast for approximately 1,800 feet. Two declines trending northwest and two inclines trending southeast were turned off several hundred feet apart at the end of the main decline. During December, a program of underground drilling was begun and approximately 1,900 feet were completed by the end of the year.

The section exposed in the decline consists of pale green quartz-chlorite phyllite in the upper part of the decline near the portal, and quartz-sericite phyllite interbanded with graphitic phyllite throughout the remainder. The phyllites have a dominant foliation trending 330° and dipping 20° to the southwest although small scale folds with amplitudes of several inches to several feet are abundant. Several short sections of massive sulphides had been exposed near the heading of the decline when it was visited in October. These massive sulphide horizons dip 45° to the southwest, discordant with the dominant foliation in the phyllites.

In addition to the underground development, approximately 68,000 feet of diamond drilling was carried out on the surface, mainly to determine the limits of the mineralized zones and to fill in gaps in the ore body. No official figures have been released as yet by the company, but the ore body is thought to contain in excess of 40 million tons of roughly 10 per cent combined lead-zinc and up to 3 ounces per ton silver.

LISA — Lead, Zinc, Copper
Cyprus Anvil Mining Corporation — 105 K 7
(62°22'N, 132°52'W)

References: Findlay (1967, p. 39); Tempelman-Kluit (1972); Sinclair and Gilbert (1975, pp. 55-56); Sinclair et al (1975, p. 132).

Claims: LISA 1-46

Location and Access:

The claims are situated 16 miles east of Anvil Mine and roughly 18 miles northeast of Faro. Access in 1975 was by helicopter from Faro.

History:

The property was staked in 1965 and has had work done on it since then, including diamond drill holes. (See Sinclair et al, 1975).

Description:

The property is underlain by greenish-grey, chlorite-muscovite-quartz phyllite of probable Cambrian age (Unit 3, Templeman-Kluit, 1972).

Current Work and Results:

Two gravity profiles were surveyed on LISA 1-4 and 15-18 claims. No anomalies were found.

NOR
Cyprus Anvil Mining Corporation

Lead, Zinc
105 K 7
(62°29'N, 132°53'W)

References: Roddick and Green (1961a); Tempelman-Kluit (1972).

Claims: NOR 1-50

Location and Access:

The claim block is situated near the headwaters of an easterly flowing tributary of the Tay River, 23 miles northeast of Faro. Elevations range from 4,000 to 6,000 feet. Access in 1975 was by helicopter.

History:

The claims were staked in September 1974 to cover copper-lead-zinc silt anomalies discovered in 1973.

Description:

The claims are underlain by a thick sequence of chert, quartzite and limestone of probable Devonian and Mississippian age (Unit 5b, Roddick and Green, 1961a). These rocks have been deformed into tight, parallel, inclined to recumbent folds trending 110° and open to close parallel folds trending 150° to 180°. Normal faults with the east side down-dropped trend approximately 150°.

On the northwest part of the claims galena occurs thinly coated on fractures in light grey, banded siliceous rocks and finely disseminated in calc-silicate bands up to several inches thick. In the central portion of the claims minor sphalerite is associated with finely disseminated to banded pyrite ± pyrrhotite in chert and fine-grained siliceous rocks in the lower part of the section.

Current Work and Results:

In 1975, a soil geochemical survey was carried out over the property which outlined a broad lead-zinc anomaly and a number of smaller anomalies.

ZED
Cyprus Anvil Mining Corporation

105 K 10
(62°31'N, 132°56'W)

Reference: Roddick and Green (1961a).

Claims: ZED 1-50

Location and Access:

The claims are situated roughly 24 miles north-northeast of Faro, from which they can be reached by helicopter.

History:

The property was originally staked as part of the ZEUS claims in 1965 but little work appears to have been carried out at that time. The ZED claims were staked in 1974.

Description:

The property is underlain mainly by fine-grained, siliceous sediments and volcanics of Upper Devonian to Lower (?) Mississippian age (Unit 5b, Roddick and Green, 1961a). Arsenopyrite is reported to occur in veins and as disseminations in tuff breccia and fine-grained, siliceous rocks (tuffs?). No other sulphide minerals have been observed.

Current Work and Results:

Soil sampling in 1975 reportedly outlined a small lead-zinc anomaly.

DANA — Lead, Zinc, Copper
Cyprus Anvil Mining Corporation — 105 K 11
(62°35'N, 133°17'W)

References: Findlay (1967, p. 39); Tempelman-Kluit (1972); Sinclair and Gilbert (1975, pp. 59-60); Sinclair *et al* (1975, p. 133).

Claims: DANA 1-76; HALO 1-12; IRMA 1-31

Location and Access:

The property is situated approximately 23 miles north of Faro. Normal access in 1975 was by helicopter or by float plane to Caribou Lake, two miles southwest of the property.

History:

The property was originally staked as the IVAN claims by Anvil Mining Corporation who drilled four holes totalling 1,553 feet in 1966. The claims subsequently lapsed and were restaked several times, most recently as the DANA claims by Ridgemont Mining Corporation, a subsidiary of Cyprus Mines Corporation. The HALO and IRMA claims were subsequently staked by Anvil Mining Corporation which became Cyprus Anvil Mining Corporation after corporate restructuring early in 1975. Three holes totalling 1,634 feet were drilled in 1975.

Description:

The claims are underlain by slate, chert, greywacke, chert-pebble conglomerate and limestone (Unit 7, Tempelman-Kluit, 1972) overlain by siliceous banded tuffs (Unit 8, op. cit.). Black sphalerite, pyrrhotite, galena and chalcopyrite are reported to occur in veinlets and as coarse, dissemianted grains in banded, calc-silicate rock (tuff?). The mineralization occurs within a large area of bleaching and alteration. To the south and down-dip, the mineralization consists of more uniformly disseminated, fine-grained brown sphalerite and pyrrhotite with minor chalcopyrite.

Current Work and Results:

Magnetic, electromagnetic and gravity surveys were conducted in 1975 and three holes were diamond drilled. The drilling is reported to have encountered lower grade and less extensive mineralization than that done in 1974.

LOLO
Lobell Mines Limited

105 K 12
(62°38'N, 135°50'W)

References: Tempelman-Kluit (1972); Craig and Laporte (1975, pp. 99-100).

Claims: LOLO 1-18

Locations and Access:

The claims are situated 30 miles north-northwest of Faro. Access in 1975 was by helicopter from Ross River.

History:

The claims were staked in May 1975. They are part of the former ALTA claim group of Canadian Reserve Oil and Gas Limited (Craig and Milner, 1975). Earlier work consisted of geological mapping, prospecting, geochemical surveys, and a limited amount of gravity and I.P. surveys.

Description:

The area of the claims is bounded on the south and east by granodiorite of the Anvil Batholith. West and north of the granodiorite, the rocks are intimately interbedded graphitic shale and argillite, quartzite, limestone, chert and andesite.

Current Work and Results:

A ground magnetic survey outlined an anomaly that corresponded with a residual gravity high of earlier surveys. Further work was recommended.

FELIX
Union Carbide Canada Mining Limited

Tungsten, Zinc
105 L 8
(62°25'N, 134°27'W)

Reference: Campbell (1967).

Claims: FELIX 1-42

Location and Access:

The property is situated two miles west of the north end of Glenlyon Lake and 20 miles north of the Campbell Highway. Access in 1975 was by helicopter.

History:

The claims were staked in June 1975.

Description:

The area is underlain by Lower Cambrian (?) or older (?) sediments, including limestone (Unit 2a, Campbell, 1967) which have been intruded by granodiorite and monzonite of Jurassic and/or Cretaceous age (Unit 20a, op. cit.). Scheelite and sphalerite are reported to occur in skarn developed at limestone-intrusive contacts.

Current Work and Results:

Work in 1975 included detailed mapping, soil sampling, geophysical surveys, hand trenching and two short diamond drill holes totalling 177 feet. Six small mineral showings were located but the mineralization appears to be erratic and of low grade.

A,B
Swim Lake Mines Limited

105 L 9
(62°33'N, 134°05'W)

Reference: Campbell (1967).

Claims: A 1-32; B 1-16

Location and Access:

The claims are located on the western flanks of Tay Mountain at the headwaters of Fishook Creek. Access is by helicopter from Faro, 40 miles to the southeast.

History:

The A claims were staked in June 1975 and the B group in November 1975.

Description:

The claims are in an area mapped as the Anvil Range Group (Unit 15, Campbell, 1967), and consist of a mixture of sediments and volcanics. Nearby they have been intruded by possible outliers of the Anvil Batholith.

Current Work and Results:

A gravity survey of 869 stations was conducted on the A claim group. Six anomalies were outlined, one of which was considered to be strong and very significant. Further work was recommended.

LOBO
Lobell Mines Limited

105 L 9
(62°35'N, 134°12'W)

References: Campbell (1967); Tempelman-Kluit (1972); Craig and Milner (1975, p. 89).

Claims: LOBO 1-14

Location and Access:

The claims are near the Tay River near its junction with the Pelly, about 30 miles northwest of Faro. Access is by helicopter from Ross River.

History:

The claims were staked in May 1975. They are tied on to the ARROW claims of Canadian Reserve Oil and Gas (Craig and Milner, 1975, p. 89).

Description:

The claims are in an area of Anvil Range rocks consisting of massive volcanics, tuffs and shale.

Current Work and Results:

A ground magnetic survey was conducted on the property.

END
Envoy Resources Limited

Copper
105 L 10
(62°40'N, 134°36'W)

References: Campbell (1967); Findlay (1969b, pp. 28-29).

Claims: END 1-24

Location and Access:

The END claims lie on the southeast side of the Pelly River, roughly six miles east-southeast of Detour Lakes. Access in 1975 was by fixed wing aircraft to a point on the Pelly River near the northwest end of the property.

History:

The property was originally staked as the JH claims in October 1966. Surface exploration on the claims was carried out by Glenlyon Mines Limited who subsequently optioned the claims to McIntyre Porcupine Mines Limited. In 1968 McIntyre diamond drilled one 550-foot hole to test exposed copper mineralization. The claims were restaked as the END claims in October 1974.

Description:

The property lies within an area of Anvil Range Group volcanics and sediments of Mississippian age or later (Unit 15, Campbell, 1967). Rocks exposed on the property consist mainly of chlorite schist trending at approximately 100° and dipping moderately to the south. Chalcopyrite in quartz veins is exposed on a small bluff in the eastern corner of the property.

Current Work and Results:

Geological mapping and soil sampling were undertaken on the property in 1975. The soil sampling outlined a number of zinc and copper anomalies generally parallel to the regional foliation. Two grab samples of float taken from the copper showing along the bluff assayed 0.75 per cent and 0.57 per cent copper respectively.

SUE
MacMillan Joint Venture

105 L 14, 15
(62°48'N, 135°00'W)

References: Campbell (1967); Findaly (1967, p. 34).

Claims: SUE - a total of 955 claims

Location and Access:

The claims form a single west-northwest trending block between the Pelly and MacMillan rivers, centred roughly 24 miles east of their junction. Access in 1975 was by fixed wing aircraft to Oz Lake from Whitehorse, 148 miles to the south, or from Mayo, 60 miles to the northwest. During the winter, supplies were hauled in over a winter tote road from Pelly Crossing. This road, originally constructed in 1966 to Detour Lakes, was extended in 1975 to the main base camp at Oz Lake in the north central part of the claim group.

History:

The property was originally staked by Conwest Exploration Company Limited in 1966 following the Anvil discovery. Work in 1966-1967 consisted of airborne magnetic and electromagnetic surveys followed up by ground magnetic and electromagnetic surveys and some diamond drilling. The property was restaked by Conwest in August 1974 as the SUE claims. The claims are currently held by MacMillan Joint Venture, a consortium between Conwest and U.S. Steel Western Hemisphere Inc.

Description:

Outcrop on the property is scarce and geological data is generally lacking. According to Campbell (1967) the property straddles the Tintina Fault which strikes roughly northwest. Northeast of the fault the property is underlain by volcancics and sediments of the Proterozoic to Paleozoic Anvil Range Group (Unit 15, Campbell, 1967). Silurian (?) and Devonian (?) sediments (Unit 15, op. cit.) occur southwest of the fault on the southwestern boundary of the property. Although occurrences of copper mineralization have been reported from the general area, no showings have been described on the property itself.

Current Work and Results:

Early in 1975, detailed ground electromagnetic, magnetic and gravity surveys were carried out. A large number of electromagnetic anomalies were encountered and zones warranting further exploration were outlined. Magnetic relief was generally low although a number of anomalies were found. Some of the magnetic anomalies were associated either directly or closely with electromagnetic anomalies but the greater portion were independent. Gravity surveys carried out over the eastern part of the claims outlined five bedrock highs or contrasting lithologies.

Geological mapping of the property and limited soil sample profiling of the gravity anomalies were conducted during part of the summer field season. Completion of the gravity surveys is scheduled for 1976.

WHITE RIVER COPPER
Silver City Mines Limited

Copper
115 F 15
(61°47'N, 140°47'W)

References: Muller (1967); Findlay (1967, pp. 51-52; 1969a, pp. 68-70; 1969b, pp. 40-41); Craig and Laporte (1975, pp. 62-63); Sinclair *et al* (1975, pp. 138-139).

Claims: MARK; NUK; GOLDEN HORN; SLAGGARD; HANNA; total of 58 claims

Location and Access:

The property is situated on the east side of the Upper White River about 18 miles south of Mile 1168 of the Alaska Highway. Access in 1975 was by float plane to Rifle Lake, the local name for a small lake near the centre of the property.

History:

Native copper has been known in the area since the turn of the century and was first staked in 1905. Detailed surface and underground exploration was carried out by Silver City Mines Limited in the late 1960's and early 1970's.

Description:

Native copper and chalcocite with minor bornite occur as irregular stringers and lenses in fractured, dark green amygdaloidal basalt and andesite of the Triassic Mush Lake Group.

Current Work and Results:

Work on the property in 1975 consisted of detailed geological mapping and examination of diamond drill core and mineralogical studies.

M
Brascan Resources Limited

Copper
115 F 16
(61°53'N, 140°20'W)

Reference: Muller (1967).

Claims: M 1-14, 19-61

Location and Access:

The claims are situated two to three miles south of Pickhandle Lake at the base of the Kluane Range. Access in 1975 was by helicopter, by a winter road from Mile 1151 (KM 1852) of the Alaska Highway or by boat along the Koidern River to small lakes near the northern corner of the property.

History:

The property was first staked as the MM and GG claims in 1968. A portion of these claims were restaked as the M 1-14, 19-51 claims in 1973 by P. Versluce and trenching carried out in 1973 and 1974. The M 52-61 claims were added in 1974 and 1975. Brascan optioned the claims in 1975.

Description:

The property lies on the southwest side of the Shakwak Trench, a major, northwest-trending fault. The underlying rocks are volcanics and related sediments of the Permian Cache Creek Group (Unit 10, Muller, 1967). Copper sulphides are reported to occur in the volcanic rocks.

Current Work and Results:

Geological mapping, prospecting and bulldozer trenching on the property in 1975 is reported to have located a small showing of chalcopyrite in the volcanics.

HUESTIS MINE* — Gold, Silver, Lead, Zinc
Nount Nansen Mines Limited — 115 I 3
(62°03'N, 137°09'W)

References: Bostock (1936a); Green and Godwin (1963, pp. 23-24; 1964, pp. 26-28); Green (1965, pp. 32-34; 1966, pp. 34-38); Campbell (1965; 1966); Findlay (1967, pp. 30-31; 1969a, pp. 35-38; 1969b, pp. 23-25); Craig and Laporte, (1972, pp. 88-89); Tempelman-Kluit (1974a).

Claims: Approximately 300 claims in the Mount Nansen area

Location and Access:

The Huestis Mine is situated 6 miles southeast of Mount Nansen, roughly 30 miles west of Carmacks and 116 miles northwest of Whitehorse. Access is via a 40-mile gravel road which leaves the Carmacks-Freegold Road about one mile west of the Nordenskiold River bridge west of Carmacks.

History:

The Huestis veins were first staked by H.H. Huestis in 1947. Surface exploration was carried out between 1962 and 1964 by the Mount Nansen Exploration Syndicate and its successor, Mount Nansen Mines Limited. In 1965, an adit was collared at the 4,295 foot level and extensive underground exploration was carried out in 1965 and 1966. In 1967, a second adit was driven on the 4,100 foot level. From September 1968 until April 1969, the Huestis and Webber veins were mined at an initial production of 70 tons per day and later 100 tons per day. Operations ceased largely as a result of the inability of the mill to obtain adequate gold recoveries without installation of a cyanide circuit.

Description:

Gold-silver vein structures up to 4 feet wide and dipping 85° to the northeast cut Proterozoic and/or Paleozoic schist and gneiss and highly altered feldspar porphyry plugs of Eocene age (Tempelman-Kluit, 1974a). The veins consist of quartz lenses containing arsenopyrite, pyrite, sphalerite, galena, stibnite and native gold. In addition, various silver-bearing minerals including freieslebenite, acanthite, native silver, andorite and argentiferous tetrahedrite have been identified (Green, 1966, p. 36).

Current Work and Results:

In September, the Huestis Mine was reopened with the idea of mining year-round at approximately 75 tons per day and stockpiling ore for operation of the mill approximately eight months out of the year. Initial work consisted of opening up the 4,100 level adit, blocked by roughly 900 feet of ice, re-timbering where necessary and general rehabilition of the underground operation. A re-evaluation of the ore body was also carried out. Up to 5 men were employed in the operation.

FOX, BEAR*
Klotassin Joint Venture

Copper
115 I 5
(62°25'N, 137°36'W)

References: Craig and Laporte (1972, p. 75); Tempelman-Kluit (1974a); Sinclair et al (1975, p. 112); Jensen (1975).

Claims: FOX 1-40; BEAR 1-40

Location and Access:

The FOX and BEAR claims straddle Big Creek roughly six miles east of Prospector Mountain and completely surround the CAR 57-72 claims. Access in 1975 was by helicopter from Carmacks, 50 miles to the east-southeast and from the airstrip on the Revenue Copper property, 10 miles southeast.

History:

The property covers the old JOHNNY and CASH claims, originally staked in 1969 by E. Schiller and explored by Atlas Explorations Limited in 1969 and 1970. The claims subsequently lapsed and were restaked in 1974 by Klotassin Joint Venture, a consortium of Newconex Canadian Exploration Limited, Molycorp Inc. and Marietta Resources International. Soil sampling in 1974 outlined a significant copper and molybdenum anomaly extending onto the FOX and BEAR claims from the CAR claims. Hand trenching in the area of the anomaly revealed traces of chalcopyrite and pyrite associated with float of feldspar porphyry and quartz monzonite.

Description:

Along the valley of Big Creek, the geology is obscured by a blanket of alluvial sediments up to 5,000 feet wide and 150 feet thick. Outcrop is scarce above the alluvial terrace except along ridges and distribution of the various rock types has been determined mainly by mapping float and rock chips in the residual soil (Jensen, 1975). In the central and northwestern part of the property, the underlying rocks consist mainly of quartz-muscovite schist and gneiss containing banded quartzite. These rocks belong to the Yukon Metamorphic Complex of Proterozoic and/or Paleozoic age and are intruded by granodiorite and hornblende monzonite belonging to the Mesozoic Klotassin Batholith. The granodiorite is typically medium-grained, equigranular and low in mafic content. It occurs mainly on the north side of Big Creek and to the southwest of the property. The hornblende monzonite ranges from coarse-grained and porphyritic to medium-grained and more equigranular. This unit occurs predominantly in the southern and southeastern parts of the property. The metamorphic rocks are also intruded by gabbro plugs of Paleozoic and/or Mesozoic age; by tuff and tuff-breccia of the Mount Nansen Group of Eocene age, in two places, north of Big Creek in the northeastern part of the claim group, and to the northwest on Prospector Mountain; and by two small stocks of feldspar porphyry of probable Eocene age and possibly contemporaneous with the

Mount Nansen Group. One stock straddles the south boundary of the CAR 57-72 group while the other, which is very poorly exposed and has been mainly defined by geophysics, straddles the east boundary. Both stocks are approximately 2,500 by 4,000 feet in size.

Structure in the area is dominated by a major tectonic lineament, referred to as the Big Creek lineament, trending northwest along the valley of Big Creek and extending to the northwest along Hayes Creek. To the southeast, extensions of the Big Creek lineament have been traced in northwest-trending faults on the Revenue Copper property and on the Laforma property on the southeast side of Freegold Mountain. Other faults observed on the property include: a southwest-trending fault with 1,000 feet of left-lateral displacement following the Big Creek valley on the west side of the property; a north-south fault with 2,000 feet of right-lateral displacement and intersecting the Big Creek lineament; and a northeast-trending fault in the southeast part of the property, parallel to the Big Creek lineament and with 1,000 feet of inferred left-lateral displacement.

Only minor sulphide occurrences have been observed on the property. Disseminated chalcopyrite and pyrite, associated with hydrothermally-altered, fine-grained porphyritic dyke rocks and unaltered quartz monzonite, were found in test pits put in near the centre of the property in the area of a pronounced copper-molybdenum soil geochemical anomaly, that corresponds roughly with a zone of metamorphic rocks on the northwest side of Big Creek and up to 5 per cent pyrite is present in the outcrop of gabbro on the north side of Big Creek. Magnetite is abundant in the metamorphic rocks and in calc-silicate skarns within the metamorphic rocks, commonly disseminated but one outcrop, within the hydrothermally-altered zone, consists of massive magnetite.

Current Work and Results:

In 1975, a time domain induced polarization survey using a pole-dipole array was conducted jointly by Klotassin Joint Venture on the FOX and BEAR claims and by Western Mines Limited on the CAR 57-72 claims. On the second separation apparent chargeability map, several anomalous areas were outlined by the 30 millisecond contour. One anomalous area on the FOX and BEAR claims occurs in the eastern part of the property and is bisected by the north-south fault. A second area, roughly 2,000 feet long and 800 feet wide and trending east-west along Big Creek, corresponds with a pronounced magnetic high and probably outlines a plug of gabbro as represented in the outcrop on the north side of Big Creek.

In addition, work began on an airstrip located on the north side of Big Creek.

CAR*
Western Mines Limited
Cream Silver Mines Limited
Belmoral Mines Limited

Copper, Molybdenum
115 I 5
(62°25'N, 137°37'W)

References: Craig and Laporte (1972, p. 75); Tempelman-Kluit (1974a); Sinclair *et al* (1975, p. 111); Jensen (1975).

Claims: CAR 57-72

Location and Access:

The property is on the south side of Big Creek roughly 5 miles southeast of Prospector Mountain. Access in 1975 was by helicopter from Carmacks, 50 miles east-southeast.

History:

The property was originally staked in 1969 as part of the CASH claims to cover a weak silt anomaly discovered in 1965 by Coranex. The claims were optioned in 1969 by Atlas Explorations Limited which carried out soil and stream sediment sampling in 1970. An anomalous copper value in stream silt was found in the central portion of the area now covered by the CAR claims but was not investigated. The CAR 57-72 claims were staked in March 1974 to cover an aeromagnetic anomaly shown on Geological Survey of Canada Aeromagnetic map 3297 G and thought to be related to a magnetite outcrop located by Atlas in 1970. Staking was prompted by the work of Dynasty Explorations Limited on a potentially gold-bearing magnetite skarn in the Freegold Mountain area, about 20 miles to the southeast. The CAR group was optioned in 1974 by Cream Silver Mines Limited, Belmoral Mines Limited and Western Mines Limited and a soil geochemical survey was subsequently carried out. Although the CAR claims actually missed the magnetite outcrop found by Atlas, the geochemical survey outlined a copper-molybdenum anomaly 5,000 by 4,000 feet on the southeast portion of the claims.

Description:

The northern half of the property lies along the valley of Big Creek, which is filled with a blanket of alluvium up to 150 feet thick. The southern half is underlain by residual soils with a scarcity of outcrop, although the distribution of lithological units has been determined from rock chips and float by Earl Jensen (1975). Further interpretation of the underlying geology has been made possible by the diamond drilling carried out in 1975.

The property is underlain primarily by metasedimentary rocks of the Yukon Metamorphic Complex of Proterozoic and/or Paleozoic age. These consist mainly of finely laminated, pale grey to green quartz-plagioclase gneiss and schist. Massive interbeds of quartzite with little or no banding are common. Sericite, formed by the alteration of plagioclase is common and locally abundant. Biotite, often altered to chlorite, is the most common mafic mineral.

The metasediments are intruded by granodiorite and hornblende monzonite of Klotassin Batholith of Mesozoic age. The granodiorite is medium- to coarse-grained and equigranular except where it intrudes or is closely associated with the metasedimentary rocks in which case it is commonly foliated or gneissic in appearance. The hornblende monzonite varies from coarse-grained and porphyritic to medium-grained and equigranular. It occurs mainly south of the CAR 57-72 claims and has not been observed in drill core.

The metasediments are also intruded by quartz-feldspar porphyry consisting of phenocrysts of rounded quartz eyes and pink feldspar up to 1 cm. long in a fine-grained, grey groundmass. It occurs in one small stock intersected by drill hole 10 near the southern boundary of the claims. A second stock, defined mainly by geophysics, is postulated to straddle the eastern boundary of the CAR 57-72 claims with the FOX and BEAR claims of Klotassin Joint Venture. Elsewhere, feldspar porphyry has been observed in drill core as dykes cutting metasediments. The feldspar porphyry is probably Eocene (?) in age and may be contemporaneous with Eocene (?) Mount Nansen Group volcanics.

Volcanics of the Mount Nansen Group of Eocene (?) age were encountered in diamond drill hole 15, in the northwestern portion of the property. The volcanics consist of dark green tuff breccia, comprised mainly of angular fragments of dark grey-green, porphyritic andesite, chloritized hornblende and plagioclase in a green, fine-grained matrix. The volcanics occur north of a northeast-trending fault postulated to cross the northwest sector of the claims and probably fill a graben formed on the down-dropped side of the fault. Dykes of andesite porphyry, related to the Mount Nansen Group volcanics, were also noted in several drill holes cutting metasedimentary rocks.

Hypogene alteration and mineralization are developed in both the quartz-feldspar porphyry and the intruded schist and gneiss. Propylitic alteration of mafic minerals to chlorite is widespread. Phyllic alteration characterized mainly by sericitic alteration of plagioclase, pervades the metasediments and is associated with pyritized fractures in quartz-feldspar porphyry, according to thin section descriptions provided by Archer, Cathro and Associates Limited. Argillic and potassic alteration are not as well-developed but occur locally around fractures. Pyrite is abundant and widespread, occurring as disseminations and fracture fillings. Chalcopyrite and molybdenite, much less abundant than pyrite, occur as fine disseminations, as very thin veinlets along hairline fractures and as occassional grains in quartz veinlets.

Supergene alteration consists mainly of oxidation and, in bedrock, ranges in depth from 30 to nearly 200 feet. Limonite and jarosite are commonly developed along fractures and gypsum is locally abundant. Secondary copper oxides, malachite and azurite, are scarce and secondary enrichment appears to have been negligible although sooty films of chalcocite have been observed in places beneath the zone of oxidation.

Current Work and Results:

In 1975, Western Mines Limited carried out a time domain induced polarization survey employing a pole-dipole array and a drilling program of 12 holes totalling 3,368 feet. The I.P. survey, conducted jointly with Klotassin Joint Venture, found two anomalous areas outlined by the 30 millisecond contour on the second separation chargeability map. One anomaly roughly 2,500 feet by 2,000 feet and centered near the southern boundary of the claims was tested by drill holes 9, 10 and 11, which intersected abundant disseminated pyrite and minor amounts of chalcopyrite and molybdenite. The second anomaly, in the northwestern corner of the property, was not tested by drilling although there are two limonitic gossans in the vicinity.

The mineralization encountered by the diamond drilling occurs mainly in a northeast-trending zone in the southeast portion of the property. Copper content ranges from less than 0.10 per cent up to 0.38 per cent with molybdenum content averaging 0.02 per cent MoS_2, although higher values, ranging up to 0.06 per cent MoS_2, were encountered in three holes. The best mineralization encountered is disseminated in metasedimentary rocks, associated with

pervasive phyllic alteration and the patchy potassic and phyllic-argillic envelopes around fractures. The second quartz-feldspar porphyry stock, on the eastern boundary of the claims and lying mainly on the FOX and BEAR claims of Klotassin Joint Venture, was not tested.

Following the drilling program, Western, Cream Silver and Belmoral terminated their option agreement. The CAR 57-72 claims were subsequently optioned by Klotassin Joint Venture.

ROC, JEN, SKUNK
Klotassin Joint Venture

Tungsten, Fluorite,
Copper
115 I 5, 6
(62°22'N, 137°25'W)

References: Craig and Laporte (1972, pp. 83-84, 87-88); Tempelman-Kluit (1974).

Claims: ROC 1-125; JEN 1-12; SKUNK 1-75

Location and Access:

The claims form a northwest-trending belt 10 miles long and two miles wide along the valley of Big Creek. The southeast end of the claims, roughly six miles northwest of Mount Freegold, adjoins the Revenue Copper property. Access in 1975 was by helicopter from Carmacks or from the airstrip on the Revenue Copper property.

History:

The ROC claims were staked in December 1974 and the JEN claims in January 1975 for Klotassin Joint Venture, a consortium comprised of Newconex Canadian Exploration Limited, Marietta Resources International Limited and Molycorp, Inc. The ROC claims on the southeast end of the belt cover a portion of the lapsed COM claims, staked in September 1969 by Cominco, who carried out soil sampling and geological mapping in 1970. The SKUNK claims were staked in December 1975 to cover some recently lapsed KLAZAN claims. The original KLAZAN claims were staked in 1965 by Coranex Limited and optioned to Atlas Explorations Limited in 1969. In 1970, Atlas carried out geochemical and geophysical surveys on the KLAZAN claims and drilled five holes totalling 2,171 feet.

Description:

Along the valley of Big Creek, the bedrock geology is obscured by a blanket of alluvial till up to 5,000 feet wide covering the valley floor. On the east end of the property, schist and gneiss of the Yukon Metamorphic Complex are exposed above the valley floor on the northeast and southwest sides of Big Creek and in a fresh cutbank on the south side of Big Creek. The schist and gneiss are intruded by granodiorite and hornblende monzonite of the Klotassin Batholith of Triassic (?) age. The granodiorite is light-coloured, medium-grained and equingranular, with a low mafic content consisting mainly of biotite. It occurs predominantly, although not exclusively, on the north-east side of the valley. The hornblende monzonite outcrops on the southwest side of the valley. This rock varies from fine-grained to coarse-grained and porphyritic and is dark-coloured due to abundant hornblende and biotite. It is weakly to distinctly foliated due to subparallel alignment of the mafics. Both the Yukon Complex and Klotassin rocks are intruded by irregular bodies of feldspar porphyry of probable Eocene age. The feldspar porphyry is light-

coloured and very fine-grained, with fine- to medium-grained phenocrysts of feldspar, quartz, biotite and hornblende comprising up to 10 per cent of the rock. On the southeast end of the property, the feldspar porphyry is probably related to the copper-bearing porphyry and breccia on the adjacent Revenue Copper property. On the central part of the property, feldspar porphyry has been traced in float on the southwest side of the valley of Big Creek.

The feldspar porphyry contains weak to moderate phyllic alteration and local areas of potassic and argillic alteration. Weak potassic alteration surrounded by moderate to strong argillic alteration is associated with the feldspar porphyry near the northwestern edge and near the middle of the property, on the southwest side of Big Creek. In the southwest corner of the property, potassic alteration is associated with brecciation of the feldspar porphyry.

Sulphide content within the altered phases of the feldspar porphyry consists of pyrite and is generally low although there is no evidence of any leaching. Minor banded and disseminated fluorite float from a gravel bar on big Creek contained coarse grains of scheelite associated with quartz and minor fluorite. The source of this float, probably a greisen, was not located.

Current Work and Results:

Geological mapping, soil sampling and magnetic surveys were carried out over the northwest and southeast portions of the property on ROC and JEN claims. No work was carried out on the SKUNK claims in 1975.

Soil sampling on the northwest part of the property outlined only scattered spot high anomalous copper values although several areas of coincident lead and zinc anomalies were found. One of these areas corresponded with feldspar porphyry and another coincided with a pyritic shear zone. To the southeast, a weak copper anomaly outlined was partially coincident with relatively strong lead and zinc anomalies that overlie a contact between hornblende monzonite to the south and schist to the north. Eight shallow bulldozer pits cut in the area of the anomalies revealed traces of malachite in schist. Soil sampling for tungsten and fluoride failed to outline any significant anomalies, even in the area of known fluorite mineralization, probably due to the thick alluvial cover in the area.

The magnetic surveys revealed low-order, irregular, northwest-trending anomalies on the northwest end of the property. No significant anomalies were found on the southeast part of the property.

AU, AG
Cyprus Anvil Mining Corporation

Copper
115 I 6
(62°17'N, 137°09'W)

References: Johnston (1937); Tempelman-Kluit (1974a); Sinclair et al (1975, pp. 115-116).

Claims: AU 1-44; AG 1-36

Location and Access:

The claims are situated on Mount Freegold, 30 miles northwest of Carmacks. Ready access is provided by short, four-wheel drive roads connecting with the Carmacks-Freegold Road.

History:

The claims were staked in 1973 and subsequently optioned by Dynasty Explorations Limited who carried out surface exploration in 1974. In 1975, Dynasty was amalgamated with Cyprus Anvil Mining Corporation.

Description:

The property is underlain by slightly altered granite and quartz monzonite of Tertiary (?) age which intrudes Proterozoic and/or Paleozoic metasediments. Minor malachite, azurite, chalcopyrite and pyrite occur in two subparallel zones 100 and 500 feet wide, respectively, in slightly altered granitic rocks.

Current Work and Results:

An I.P. survey carried out in 1975 over the two mineralized zones failed to outline any significant anomalies in the area of known mineralization. Elsewhere, two anomalous zones were outlined although subsequent soil sampling and a magnetic survey failed to detect either anomalous copper geochemical values or any high magnetic readings in these zones.

ZIT — 115 I 6
Klotassin Joint Venture — (62°17'N, 137°13'W)

References: Green (1966, pp. 31-33); Tempelman-Kluit (1974a).

Claims: ZIT 1-24

Location and Access:

The property is situated 5 miles west of Freegold Mountain on Bow Creek near its junction with Seymour Creek. Access to the property is via the Carmacks-Freegold Road, the extension of which passes through the eastern edge of the property.

History:

Part of the area covered by the ZIT claims was covered by the M and MERG claims staked in 1964 by Canex Aerial Exploration Limited to tie on to the Revenue Copper property. These claims subsequently lapsed and were restaked as the PORPHRY claims in 1968 and the KOOK claims in 1969. Some bulldozer trenching was carried out on the KOOK claims, north of the current ZIT group, in late 1969 by Montana Mines Limited. The ZIT claims were staked in January 1975 on behalf of Klotassin Joint Venture, a consortium composed of Newconex Canadian Exploration Limited, Marietta Resources International Limited and Molycorp, Inc.

Description:

The property is underlain primarily by granodiorite of Jurassic (?) age. Near the north boundary of the claims the granodiorite intrudes schist and gneiss of Proterozoic and/or Paleozoic age and near the south boundary the granodiorite is overlain by Eocene volcanics of the Mount Nansen Group. Argillic alteration was observed in one outcrop of quartz-biotite porphyry located near the west boundary of the property. Pyrite is present in a northwest-trending shear zone near the southeastern corner of the property.

Current Work and Results:

Soil sampling in 1975 outlined four zones of weakly anomalous copper and molybdenum response and one zone of anomalous lead response.

LAFORMA*
Rayrock Mines Limited
Ashland Oil Canada Limited

Gold, Silver
115 I 6
(62°16'N, 137°07'W)

References: Johnston (1937); Green (1966, pp. 29-31); Findlay (1967, p. 29); Tempelman-Kluit (1974a); Sinclair *et al* (1975, pp. 116-117).

Claims: DONALDA 1-9; MILL 1-3; GOOSE; JIM; BILL (Fr); CONNIE; BAKER; NEIL; MONA; PAL; KEY (Fr); YUKONIA 1-6; MAYFLOWER; LOON (Fr); LIZ (Fr); KIM (Fr): total of 32 claims and fractions.

Location and Access:

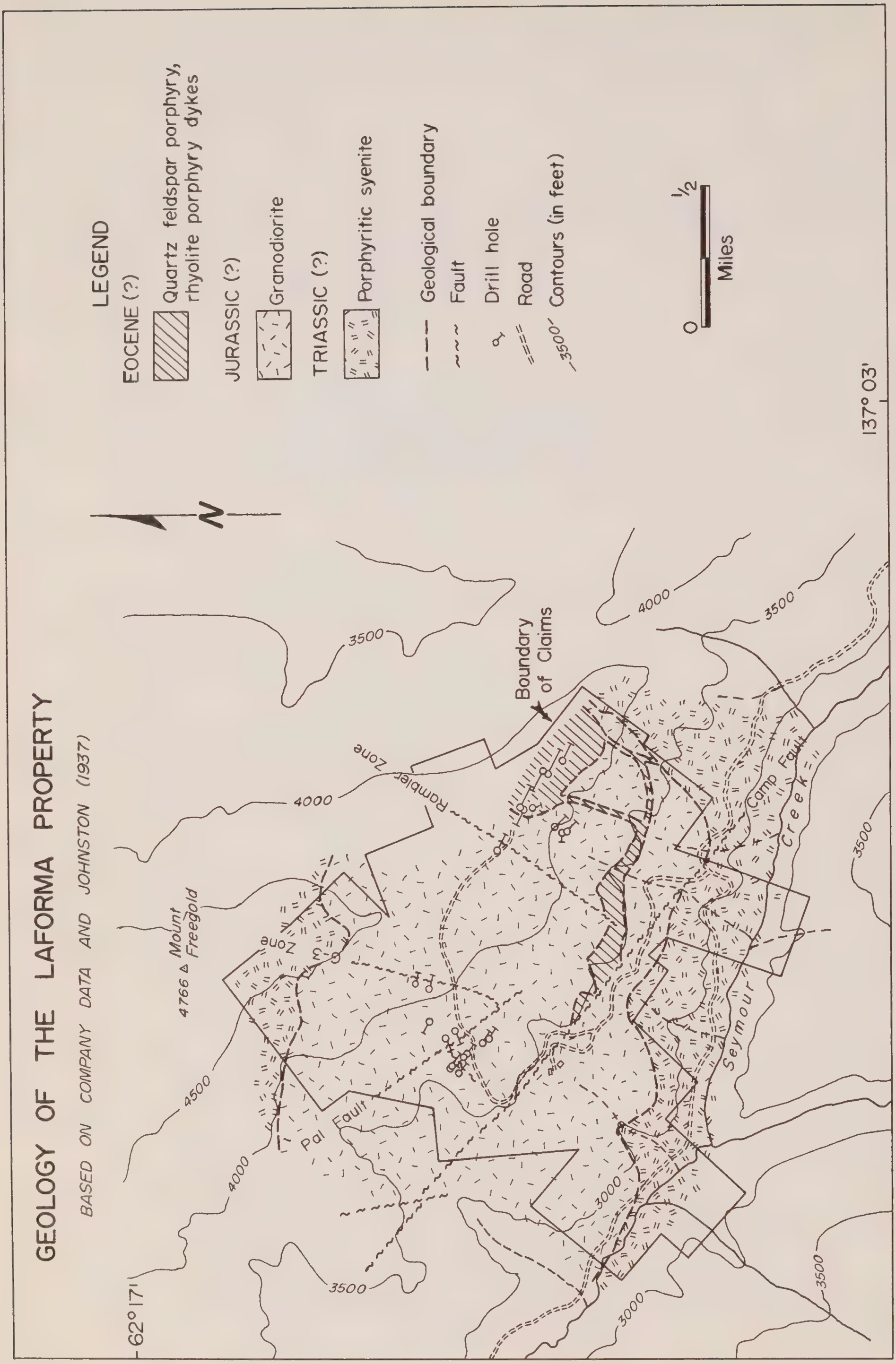
The property is situated 28 miles west-northwest of Carmacks on the southeast slope of Mount Freegold at elevations ranging from 3,000 to over 4,500 feet. Access to the property is by a road about one mile long that connects with the Carmacks-Freegold Road near Mile 41.

History:

The property was originally staked in the rush following the discovery of gold on Freegold Mountain in 1930 (the name of the property, LAFORMA, is a contraction of the names of the original owners, Langham, Forrest and Major). In 1934, the property was optioned by the N.A. Timmins Corporation and underground development began in 1935. Additional work was done by Yukon Consolidated Gold Corporation during the winter of 1935-36. In 1938, T.C. Richards of Whitehorse optioned the property and erected a small mill. From January 1939, to June 1940, Mr. Richards produced approximately 1,437 ounces of gold from 1,414 tons of ore. Ormsby Mines purchased the property in 1960 and began a re-examination in 1961. Discovery Mines Limited, formed by amalgamation of Consolidated Discovery Yellowknife Mines Limited and Ormsby Mines Limited in March 1964, operated the mine and a new mill from June 1965 to February 1966, during which period about 1,610 ounces of gold and 570 ounces of silver were produced. Operations were suspended due to rising labour costs, poor recovery and lower grades than originally estimated. In 1974, Rayrock Mines Limited and Ashland Oil Canada Limited began a re-evaluation of the property, starting with geochemical surveys which outlined a number of arsenic and gold anomalies.

Description:

The property is underlain mainly by granodiorite of Jurassic age or older (Tempelman-Kluit, 1974a) and closely related hornblende syenite. The granodiorite is grey, medium- to coarse-grained and composed of approximately 50 per cent plagioclase, 30 per cent quartz, 15 per cent potash feldspar and 5 per cent hornblende with accessory sphene and magnetite noticeable in hand specimens. The granodiorite underlies much of the central portion of the property. The hornblende syenite is conspicuously coarse-grained and porphyritic. It is composed of about 50 per cent potash feldspar, occurring mainly as salmon-pink phenocrysts varying from 2 to 6 cm in length, 20 per cent hornblende, 20 per cent plagioclase and up to 10 per cent quartz with sphene as a noticable accessory. The hornblende syenite occurs mainly along the margins of the property. Although contacts between the granodiorite and hornblende syenite are often gradational, regional evidence suggests that the granodiorite intrudes the hornblende syenite.



GEOLOGY OF THE LAFORMA PROPERTY
BASED ON COMPANY DATA AND JOHNSTON (1937)
LEGEND
EOCENE (?)
Quartz feldspar porphyry, rhyolite porphyry dykes
JURASSIC (?)
Granodiorite
TRIASSIC (?)
Porphyritic syenite
Geological boundary
Fault
Drill hole
Road
3500′ Contours (in feet)
0
1/2
Miles
62° 17′
137° 03′
4766 Mount Freegold
Zone
Rambler Zone
Boundary of Claims
Pal Fault
Camp Fault
Seymour Creek
4500
4000
3500
3000

The granodiorite and hornblende syenite, in turn, are intruded by andesite porphyry, quartz-feldspar prophyry and rhyolite porphyry dykes of probable Tertiary age (Tempelman-Kluit, 1974a). The andesite porphyry is fine-grained and dark grey-green with minor white feldspar phencorysts. The quartz-feldspar porphyry consists of euhedral hornblende, quartz and potash feldspar phenocrysts in a dark grey-green, microcrystalline matrix. The rhyolite porphyry is dark grey to creamy white, typically very fine-grained with minor small phenocrysts of rounded quartz and subhedral feldspar. The rhyolite porphyry appears to be gradational with rhyolite breccia composed of angular fragments of granodiorite and syenite porphyry in a fine-grained matrix of quartz and sericite. The fragments are typically 1 to 2 cm in diameter but in one drill hole, near the eastern corner of the property, fragments were up to 3 m across, separated by short sections of fine-grained rhyolite breccia. Rhyolite porphyry and rhyolite breccia occur in numerous dykes in the east corner of the property where they are observed mainly in drill core and in a prominent rhyolite porphyry dyke that trends east-west across the southeast portion of the property.

Two sets of steeply-dipping faults are present on the property, one trending northwest and the other northeast. One prominent northeast-striking fault, visible on air photos and referred to locally as the Camp Fault, is probably related to a major, northwest-trending lineament extending to the northwest along Big Creek. Two important north- to northeast-striking faults or shear zones, the G-3 and Rambler Zones, contain the gold-bearing quartz veins, the object of much of the earlier exploration and development.

The granodiorite and hornblende syenite have undergone varying degrees of hydrothermal alteration. Propylitic alteration, characterized by chloritization of hornblende and biotite, is widespread and may be due, in part, to supergene processes. Argillic alteration is more local and generally occurs in proximity to rhyolite porphyry and rhyolite breccia, and in the wall rocks of mineralized shear zones. The most conspicuous features of this are alteration of plagioclase to a greenish-white, fine-grained mixture of clay minerals and pervasive pyritization. Disseminated arsenopyrite is abundant locally. Quartz and chlorite veinlets and associated silicification mark the most intense alterations and generally occur in close proximity to rhyolite porphyry and rhyolite breccia.

Two types of mineralization occur on the property. The first consists of gold-bearing quartz veins in north- to northeast-trending shear zones cutting granodiorite. Sulphides associated with these veins include pyrite, present both in the veins and in the altered wall rocks, as well as arsenopyrite, minor galena and sphalerite and rare chalcopyrite and pyrrhotite. The second type of mineralization consists of disseminated pyrite and arsenopyrite in altered granodiorite and hornblende syenite, and in rhyolite breccia. Pyrite and arsenopyrite also occur, to a lesser extent, in cross-cutting fractures. Chalcopyrite, bornite, chalcocite and tetrahedrite are associated with this pyrite and arsenopyrite but are relatively rare.

Current Work and Results:

Work in 1975 was aimed primarily at locating and evaluating the possible extension of the G-3 Zone, terminated to the south by the Pal Fault, and at testing the broad arsenic and gold geochemical anomalies outlined east of the Rambler Zone near the eastern corner of the property. The work consisted of 23 diamond drill holes totalling 7,828 feet.

A northeast-trending shear zone in granodiorite, thought to represent the faulted extension of the G-3 Zone was located on the southwest side of the Pal Fault roughly 1,400 feet northwest of the G-3 Zone. Assay results for gold and silver from holes drilled on this zone were generally low. Similar results were obtained from holes drilled on the northern part of the G-3 Zone.

The holes drilled east of the Rambler Zone encountered altered granodiorite and rhyolite breccia containing disseminated pyrite and arsenopyrite. Pyrite and arsenopyrite are also present in fractures, as veinlets up to 5 mm across. Gold and silver assays from one hole ran 0.067 ounces of gold and 0.34 ounces of silver per ton over a core length of 69 feet but, in general, assays from other holes were lower. One hole carried 0.018 ounces of gold and 0.08 ounces of silver per ton for over 500 feet. The gold and silver content appears to increase with the degree of alteration of the granodiorite which, in turn, appears to be related to rhyolite porphyry and rhyolite breccia. There is no clear relationship between gold and silver values and the relative abundance of either pyrite or arsenopyrite. Copper mineralization is very weak, only minor copper sulphides have been observed, but appears to increase slightly to the east. Iron oxides and manganese staining are locally abundant along fractures and may extend to several hundred feet below surface. Some secondary chalcocite on pyrite grains has been observed but, in general, there is no evidence of intense leaching or development of a secondary enriched zone.

PANTHER	Gold
D.C. Syndicate	115 I 12
	(62°31'N, 137°47'W)

Reference: Tempelman-Kluit (1974a).

Claims: PANTHER 1-6

Location and Access:

The claims are situated on the northeast side of Hayes Creek, roughly four miles north of Prospector Mountain. Helicopter was the normal mode of access in 1975.

History:

The claims were staked in June 1975 on the basis of reconnaissance exploration done in 1974.

Description:

The property is generally underlain by granitic rocks of the Triassic Klotassin Batholith which are overlain to the north and east by Eocene volcanics of the Carmacks Group (Tempelman-Kluit, 1974a). Gold values as high as 0.03 ounces per ton have been reported from a north-trending, silicified shear zone similar to that found on the RAINBOW claims to the north.

Current Work and Results:

A limited amount of geological mapping and soil sampling was carried out on the property in 1975.

RAINBOW*
D.C. Syndicate

Gold
115 I 12
(62°34'N, 137°45'W)

Reference: Tempelman-Kluit (1974a).

Claims: RAINBOW 1-20

Location and Access:

The claims lie near the headwaters of Wolverine Creek, four miles west of Mount Pitt. Access in 1975 was by helicopter from Minto, 27 miles to the east.

History:

The claims were staked in May 1975 by D.C. Syndicate following reconnaissance exploration in the area in 1974.

Description:

Much of the area is underlain by metasedimentary rocks of Proterozoic and/or Paleozoic age intruded to the south by granitic rocks of the Klotassin Batholith of Triassic age (Tempelman-Kluit, 1974a). The granitic rocks exposed on the property consist of a fine- to medium-grained, equigranular quartz monzonite composed of approximately equal portions of plagioclase, potash feldspar and quartz. Less than one per cent biotite is present as small, interstitial grains.

The quartz monzonite and the metasediments are cut by a steeply-dipping north-trending shear zone up to 550 feet wide. The shear zone locally contains fine- to medium-grained, angular breccia fragments, highly silicified and generally within a very fine-grained, siliceous matrix. Elsewhere, the shear zone is composed of closely-spaced fractures filled with fine-grained silica. Iron and manganese staining is abundant; some fresh grains of disseminated pyrite were noted locally. Alteration of the quartz monzonite, consisting mainly of alteration of plagioclase to white clay minerals, is evident for up to 100 feet on either side of the shear zone. Surface samples from the shear zone assayed as high as 0.02 ounces of gold per ton.

Current Work and Results:

Following detailed geological mapping and geochemical soil sampling, a series of four bulldozer trenches were cut east-west across the north-trending shear zone. Most of the samples taken from the trenches assayed less than 0.01 ounces of gold per ton although one sample of sheared schistose granite assayed 0.16 ounces of gold per ton.

RAND
D.C. Syndicate

115 I 12
(62°35'N, 137°47'W)

Reference: Tempelman-Kluit (1974a).

Claims: RAND 1-2

Location and Access:

The claims are on a ridge between two east-flowing tributaries of Wolverine Creek, 5 1/2 miles west of Mount Pitt. Access in 1975 was by helicopter.

History:

The claims were staked in July 1975.

Description:

The area is underlain by metasedimentary rocks of Proterozoic and/or Paleozoic age (Tempelman-Kluit, 1974a). A north-trending silicified shear zone is reported to occur on the property.

Current Work and Results:

A limited amount of geological mapping and soil sampling was carried out in 1975.

NADA
D.C. Syndicate

Copper, Gold
115 I 12
(62°38'N, 138°00'W)

References: Tempelman-Kluit (1974b); Sinclair *et al* (1975, pp. 95-96).

Claims: NADA 1-24

Location and Access:

The claims are situated on and west of Hayes Creek immediately above the mouth of Klines Gulch. Access in 1975 was by helicopter from Minto, 36 miles to the east.

History:

Placer gold was discovered in Klines Gulch in 1898 and quartz veins were found in 1899. Lode exploration was carried out in the 1960's and early 1970's by a number of companies (Sinclair *et al*, 1975, pp. 95-96). The NADA claims were staked in 1974 by D.C. Syndicate who carried out geological and geochemical surveys on the property.

Description:

The property is underlain by metasedimentary rocks of Proterozoic and/or Paleozoic age (Tempelman-Kluit, 1974b) which are intruded by a small stock of quartz monzonite of Triassic or Jurassic (?) age. Traces of chalcopyrite and molybdenite associated with disseminated pyrite and locally pyrrhotite occur in the quartz monzonite and in the bleached, quartz-veined contact zone of the metasediments.

Current Work and Results:

Detailed geological mapping and geochemical sampling carried out in 1975 yielded discouraging results; the best values obtained from rock samples were 0.1 per cent copper and 0.005 ounces of gold per ton. The claims have subsequently been allowed to lapse.

AS*
D.C. Syndicate

115 I 12
(62°39'N, 137°57'W)

References: Craig and Laporte (1972, pp. 70-71); Tempelman-Kluit (1974a).

Claims: AS 1-16

Location and Access:

The claims are situated on the east side of Hayes Creek, immediately south of Selkirk Creek. Elevations on the property range from 2,100 feet to slightly over 4,700 feet. Access in 1975 was by helicopter from Minto, 36 miles to the east.

History:

The property was originally staked in 1969 as the HAYES claims and subsequently acquired by Delta International Minerals Limited who conducted geological and geochemical surveys in 1970. The property was restaked in July 1975 by D.C. Syndicate as the AS claims.

Description:

The property is underlain primarily by metasediments consisting of quartz-mica schist, chlorite schist and quartz-mica gneiss of Proterozoic and/or Paleozoic age (Tempelman-Kluit, 1974a). A northwest-trending band of limestone float about 3,000 feet long is present in the northeastern corner of the property. In the central part of the claim group the metasedimentary rocks are intruded by a brown-weathering quartz monzonite porphyry of probable Jurassic age that forms a northwest-trending body about 6,000 feet long. This unit contains 5 to 10 per cent quartz phenocrysts, slightly rounded and up to 6 millimetres across; 30 to 40 per cent white, plagioclase phenocrysts, equant and up to 5 millimetres across, and up to 5 per cent green sericite phenocrysts (altered plagioclase?) 3 millimetres or less in size. The matrix is a grey, aphanitic mixture of quartz and potash feldspar. In the southwest portion of the property the metasedimentary rocks are also intruded by a light-coloured, porous and possibly miarilitic, quartz-feldspar porphyry.

A prominent air photo linear trends approximately 050° across the northeastern part of the property.

The metasedimentary rocks and locally the quartz monzonite porphyry are reported to contain from 1 to 3 per cent of finely disseminated pyrite (Craig and Laporte, 1972, pp. 70-71).

Current Work and Results:

Geological mapping and soil sampling carried out in 1975 by D.C. Syndicate outlined a number of arsenic, lead and silver anomalies. Three bulldozer trenches put in during the summer exposed mainly barren quartz monzonite porphyry and quartz-mica schist.

SAM
Canadian Superior Exploration Limited

115 I 12
(62°43'N, 137°39'W)

Reference: Tempelman-Kluit (1974a).

Claims: SAM 1-29

Location and Access:

The claims are situated on the north side of Wolverine Creek 28 miles west-northwest of Minto. Access in 1975 was by helicopter.

History:

The claims were staked in August 1974 following reconnaissance exploration by Canadian Superior Exploration Limited. Detailed soil geochemical, I.P. and magnetic surveys were carried out later in the season.

Description:

Outcrop on the property, although scarce, consists of biotite-quartz-feldspar gneiss, locally with minor amphibolite and feldspathic gneiss on the northern portion and of amphibolite containing some feldspathic and biotite schist bands on the southern portion. Foliation strikes roughly east-west and dips steeply to the north. No mineral showings have been discovered.

Current Work and Results:

In 1975, although hindered by permafrost, a bulldozer trench was cut across a weak copper geochemical anomaly. Biotite-quartz-feldspar gneiss, locally containing some iron oxides was exposed. No copper minerals were observed.

PATT
Amoco Canada Petroleum Company Limited

Copper, Molybdenum
115 J 10
(62°32'N, 138°38'W)

References: Tempelman-Kluit (1974b); Sinclair *et al* (1975, p. 94).

Claims: PATT 1-48

Location and Access:

The claims lie near the headwaters of Pattison Creek, 15 miles south-southeast of the Casino copper-molybdenum deposit. Access in 1975 was by helicopter.

History:

The claims were staked in 1974 at which time geological mapping and soil sampling outlined a copper-molybdenum soil anomaly.

Description:

Minor copper and molybdenum sulphides have been reported in association with a small body of alaskite intruding granodiorite and monzonite.

Current Work and Results:

An I.P. survey was crried out on the property in 1975 and several areas of anomalous chargeability were outlined.

DOYLE
Amoco Canada Petroleum Company Limited

Copper, Molybdenum
115 J 11
(62°39'N, 139°13'W)

References: Tempelman-Kluit (1974b); Sinclair et al (1975, pp. 93-94).

Claims: DOYLE 1-40

Location and Access:

The claims are situated at the headwaters of Doyle Creek, roughly 12 miles west-southwest of the Casino copper-molybdenum property. Access to the property in 1975 was by helicopter.

History:

The claims were staked in 1974 during a regional geochemical and mapping program. Detailed mapping and sampling carried out later in the season outlined a copper-molybdenum soil anomaly.

Description:

Outcrop on the property consists mainly of Triassic hornblende granodiorite of the Klotassin Batholith (Tempelman-Kluit, 1974b). Minor copper and molybdenum sulphides were found in a locally altered stock of quartz monzonite that intrudes the granodiorite.

Current Work and Results:

An I.P. survey carried out on the property in 1975 failed to locate any areas of anomalous chargeability.

CC
Amoco Canada Petroleum Company Limited

115 J 11
(62°41'N, 139°11'W)

References: Tempelman-Kluit (1974b); Sinclair et al (1975, p. 93).

Claims: CC 1-36

Location and Access:

The claims are situated in the area of Coffee Creek, roughly ten miles west-southwest of the Casino Copper-molybdenum property. Access in 1975 was by helicopter.

History:

The claims were staked in 1974 during a regional geochemical survey. Subsequent geological mapping and detailed soil sampling outlined a small copper-molybdenum soil anomaly.

Description:

Outcrop is lacking on the property although float in the general area suggests it is underlain by Triassic hornblende granodiorite of the Klotassin Batholith (Tempelman-Kluit, 1974b).

Current Work and Results:

An I.P. survey carried out on the property in 1975 outlined several areas of anomalous chargeability.

DEA*	Gold, Silver, Lead, Zinc
Great Bear Mining Limited	115 N 2
	(63°05'N, 140°53.5'W)

References: Tempelman-Kluit (1974b); Morin (1975).

Claims: DEA 1-48, 50, 51, 55F, 56F

Location and Access:

The DEA group of 52 claims is located about 45 miles north of Beaver Creek, and is accessible by helicopter from that point. A winter tote road connects the property to the Alaska Highway in Alaska. In addition, float-equipped fixed wing aircraft can land at Wienerwurst Lake (local name), about 5 miles southwest of the property.

History:

The occurrence was found by float prospecting in 1970 when Quintana Minerals personnel discovered galena and sphalerite-bearing boulders of vein quartz that carried visible gold. The area was staked as the SIL claims, but was allowed to lapse and was subsequently restaked by A. Harman in 1972 and transferred to Great Bear Mining Limited. Claymore Resources Limited staked the LORI (1-58) group in January 1975, adjoinging the DEA group to the west and south.

Description:

A pluton of undefined outline underlies the DEA and LORI claim groups. It consists of massive medium- to coarse-grained equigranular biotite-hornblende granodiorite which weathers to a white colour and is made up of 10-20 per cent quartz, 20-40 per cent of biotite and hornblende in varying proportions and the remainder white feldspar. Plagioclase, the dominant feldspar, occurs as medium- to coarse-grained, euhedral to subhedral, strongly zoned grains. The zoning is normal to normal oscillatory and convolute patterns and resorption features are common. Sericitization is present in trace to moderate amounts. Quartz occurs as coarse-grained (up to 1.5 cm) interstitial lensoid aggregates of medium-sized, unstrained grains with sutured interlocking boundaries. K-feldspar is present as medium- to coarse-grained, subhedral to anhedral, microcline perthite, mainly of an interstitial habit. Hornblende consists of subhedral stubby poikilitic green grains ranging up to 1 cm in size. Biotite is present as subhedral medium-grained laths which are commonly chloritized. Accessory minerals include fine-grained epidote, magnetite, apatite and sphene.

Locally inclusions of amphibolite are common within the granodiorite and, where they occur, the latter rock is enriched in hornblende, suggesting that some, if not all, of the hornblende-rich phases may be due to assimilation.

*Visited by J.A. Morin

Chemical analyses of these rock types and porphyritic rocks discussed below are presented in the accompanying table.

Porphyritic granitic rocks are common in the southern portion of the Moosehorn Range. Their field relations are not obvious, but they are probably intrusive dykes into the granodiorite of the Moosehorn Range. Locally, however, the porphyritic phase does appear to grade into equigranular hornblende granodiorite over short distances. In addition, rounded xenoliths of porphyritic andesite occur in places within the porphyry, suggesting that the intrusions are hypabyssal.

The porphyries weather dark grey and consist of coarse-grained hornblende and white feldspar phenocrysts (0.5-1.5 cm) set within a fine- to medium-grained matrix of feldspar, biotite and quartz. The dominant phenocrysts are strongly zoned euhedral crystals of plagioclase ranging from 1 to 8 mm in size, with the average about 2 to 4 mm. More than 80 zoning shells were observed in a plagioclase phenocryst from one sample. K-feldspar phenocrysts are rare, but where present, consist of coarse euhedral grains of microcline perthite. Biotite forms stubby equant medium-grained, phenocrysts of green hornblende are locally altered to felted masses of actinolite. Quartz is present as fractured, equant, euhedral grains ranging from 1 to 8 mm diameter. Accessory fine-grained magnetite, apatite and sphene are commonly associated with the mafic phenocrysts and to a minor extent, are disseminated within the matrix. The matrices are very fine-grained and consist of varying amounts of anhedral plagioclase, K-feldspar, quartz and biotite.

Jointing is common in the massive granodiorite of the Moosehorn Range and occurs to a lesser extent in the other rock types. The quartz vein-bearing joints commonly trend about 150 to 175° with shallow dips to the east. This trend coincides with that of the aeromagnetic anomaly over the Moosehorn Range.

Miarolitic cavities occur within the quartz veins cutting the Moosehorn Range granodiorite. These cavities, while common, are up to several centimetres long and about one centimetre wide, and are typically lined with quartz crystals along with minor amounts of sulphide minerals.

Over the Moosehorn Range granodiorite, a north-northwest-trending elongate elliptical anomaly coincides with the pluton and the trend of the Range. The values vary from 57,340 to 57,580 gammas.

Mineralization in the Moosehorn Range consists of auriferous quartz veins in granodiorite on the DEA claim group of Great Bear Mining Company Limited and the LORI group of Claymore Resources. Milky white quartz veins of variable thickness (0.1-0.5 metres) occur mainly along north-northwest-trending joints with shallow dips of 20 to 40°. Gold occurs as coarse grains up to 2 mm in size, commonly associated with sphalerite. In addition, galena, arsenopyrite and boulangerite occur as coarse-grained crystals and as streaky fine-grained bands within the quartz veins. The wall rock alteration consists of pale green sericitized and silicified granodirotie with disseminated medium-grained crystals of arsenopyrite. Widths of the alteration zone vary from a few centimetres up to half a metre and they are not proportional to the widths of the quartz veins themselves.

Weathering of the granitic rocks and quartz veins has resulted in local concentrations of gold in residual soils. Through the processes of solifluction, much of the sand and gravel from the slopes of the Moosehorn Range has moved into the upper reaches of local creeks.

During the summer of 1975, there was much interest in the gold-bearing potential of the eluvial and alluvial material derived from the Moosehorn Range. This is discussed in the placer section of this report.

CHEMICAL ANALYSES OF GRANITIC ROCKS, MOOSEHORN RANGE

	1	2	3	4
SiO_2	66.10	72.70	65.70	70.40
Al_2O_3	16.40	14.50	16.80	14.80
Fe_2O_3	2.46	1.03	1.93	1.09
FeO	2.81	1.84	2.96	3.85
MgO	1.58	0.35	1.42	0.70
CaO	4.65	1.90	4.50	2.40
Na_2O	2.70	3.05	3.20	2.85
K_2O	2.46	3.75	2.50	3.10
TiO_2	0.37	0.14	0.37	0.25
MnO	0.10	0.04	0.06	0.06
P_2O_5	0.16	0.57	0.14	0.11
L.O.I.	0.36	0.13	0.66	0.01
Total	100.05	100.00	100.34	99.62

Note: #1 - hornblende-biotite granodiorite, LORI claims group
#2 - biotite-hornblende quartz monzonite, DEA claim group
#3 - quartz diorite porphyry, LORI claim group
#4 - granodiorite porphyry, LORI claim group

Analysts - Bondar-Clegg and Company Limited, Vancouver, B.C.

Current Work and Results:

In 1974-1975, the company conducted grid soil geochemical and geophysical surveys (ground Magnetometer, EM 16), detailed geological mapping (1 inch = 200 feet), hand and bulldozer trenching and bulk sampling. In 1974, a total of 461 soil samples were collected on a 100 foot by 100 foot grid and analyzed for lead, zinc, silver and arsenic. In 1975, 567 samples were collected on an extension of the grid and analyzed for the same elements. In general, the anomalous silver and lead values corresponded with the known quartz veins. Several trenches have been cut on the property and seven main quartz veins carrying gold have been discovered.

During summer 1975, 19 diamond drill holes were drilled for a total footage of 2,283.5 feet (BQ core). In most instances, the auriferous quartz veins were intersected at depths less than 40 feet and, in general, the veins were narrow with low, erratic gold values. Some of the higher values obtained from the trenching and drilling are presented below (Northern Miner, August 28, July 31, 1975:

Zone	DDH	Au oz/ton	Ag oz/ton	Width
B	#16	7.49	1.16	6 inches
D	# 1	0.07	0.10	12 inches
D	# 2	1.6	12.4	3 inches
C	# 5	3.62	8.75	6 1/2 inches
C	# 6	0.65	1.22	4 inches

A consulting geologist recommended that further work on the property consist of additional geological mapping, prospecting, closely spaced soil sampling for silver, bulldozer trenching and a minimum of nineteen drill holes totalling about 6,000 feet.

LORI*
Claymore Resources Limited

Gold, Silver
115 N 2
(63°05'N, 140°55'W)

References: Tempelman-Kluit (1974b); Morin (1975).

Claims: LORI 1-58; CARL 1-14; GEO 1-18

Location and Access:

The LORI group is located about 45 miles north of Beaver Creek and is accessible by helicopter. A winter tote road connects the property to the Alaska Highway in Alaska.

History:

The occurrence was discovered by M. Kenyon in August 1974 during a regional porphyry copper prospecting program for Rio Tinto Limited. In January 1975 the property was staked by Claymore Resources.

Description:

The area is underlain by granitic rocks of the Klotassin Batholith which intrude schists and gneisses of uncertain age (see description of DEA property). At least two quartz veins, ranging from 1 1/2 to 2 feet in thickness, have been traced in float for a distance of about 800 feet on the top of Moosehorn Range and on its western flank. The float locations indicate that the veins trend approximately north-south and are sub-parallel with the quartz veins on the adjacent DEA group to the east.

The mineralogy of the veins consists of milky white quartz with minor boulangerite (the dominant sulphide), sphalerite, arsenopyrite, galena, pyrite and visible traces of gold. The sulphide minerals are typically aligned in discontinuous bands parallel to the strike of the vein. Minor pale green sericite and limonite alteration is also present within the quartz vein. The vein on the ridge top was sampled along its length by two independent samplers and their assay results are consistent; ranging from trace to 40 ounces of gold per ton and trace to 20 ounces of silver per ton. No correlation was observed between the gold and silver values.

Current Work and Results:

In June 1975, I.P., S.P., E.M. and magnetometer grid surveys were performed over the area where the quartz veins occur. It is reported that none of the methods were of use in delimiting the veins. In addition, a grid geochemical survey was carried out, and a diamond drilling program was undertaken to test the main ridge top vein. The best values obtained from drilling are the following (Northern Miner, July 31, 1975):

DDH	Au oz/ton	Ag oz/ton	Width
#1	0.16	1.14	several sections less than 12 inches
#2	0.19	0.14	4 feet
#3	0.18	0.33	4 feet

At the time of the release, eight diamond drill holes had tested 100 feet of the vein strike length over a confirmed length of 2,000 feet.

*Visited by J.A. Morin

A total of 18 holes were drilled with a cumulative footage of 2,050 feet. Results from the balance of the holes, most drilled on the 'M' vein, must be considered disappointing.

Emphasis was diverted toward the discovery of placer gold in the creeks to the west of the veins. This aspect of the property is discussed in the Placer section of this publication.

WATSON LAKE MINING DISTRICT

* - Properties visited by W.D. Sinclair unless otherwise indicated.

McMILLAN PROPERTY*
Noranda Exploration Company Limited

Lead, Zinc, Silver
95 D 5, 12
(60°30'N, 127°56'W)

References: Smitheringale (1963); Green (1966, pp. 72-74); Gabrielse and Blusson (1969).

Claims: DOROTHY; SOUTH NAHANNI; M; PIC; WHI; QTZ; STRAT: total of approximately 180 claims and fractions.

Location and Access:

The McMillan showing is exposed in the valley of a small creek, at an elevation of 3,200 feet and approximately three-quarters of a mile southwest of McMillan Lake, a small lake roughly one mile west of Hulse Lake (formerly known as Quartz Lake). Access to the property in 1975 was by fixed wing aircraft to Hulse Lake from Watson Lake, 40 miles to the southwest, or by helicopter.

History:

From old records discovered at Dease Lake (R.J. Cathro, per. comm.), it is apparent that the McMillan showing was known to prospectors as early as 1892 but little is known of work on the property at that time. The showing was rediscovered and staked in 1948 by the late Ken McMillan, formerly of Lower Post, B.C., who optioned the property to Noranda. In 1949, Noranda optioned the property to New Jersey Zinc and in 1951, a joint venture was undertaken with American Smelting and Refining Company, who subsequently formed a subsidiary, Liard River Mining Company Limited, to operate on the property. From 1949 to 1956, exploration on the property included over 19,000 feet of diamond drilling in 83 holes. Results of this work indicated a massive sulphide deposit containing roughly 1 million tons of 5 per cent lead, 10 per cent zinc and 1.8 ounces of silver per ton (Smitheringale, 1963). Additional work by Liard River Mining Company has included an I.P. survey in 1967, 10 diamond drill holes totalling 3,400 feet in 1968 and geochemical surveys from 1970 to 1972. In 1975, Noranda Exploration undertook exploration on the property and staked an additional 95 claims, the STRAT group.

Description:

The property is underlain by Hadrynian sedimentary rocks consisting of maroon and green argillites containing quartzite and limestone horizons (Unit 1, Gabrielse and Blusson, 1969). The sediments strike generally to the northwest and dip 10° to 30° to the northeast. They are cut by a number of steeply-dipping, north-trending faults and by thrust faults dipping gently to the east.

The McMillan deposit is a zone of massive sulphides up to 50 feet thick and generally conformable with the enclosing calcareous argillite and limestone host rocks. The massive sulphides consist mainly of pyrite with galena, sphalerite and small amounts of arsenopyrite, boulangerite, tetrahedrite and chalcopyrite. Buff-coloured siderite gangue is abundant locally. The sulphides are in part porous with abundant quartz crystals and some sphalerite crystals lining cavity walls and, elsewhere, finely laminated to crudely banded. Polished slabs of sulphides cut from surface showing display a crude banding which is disrupted and uneven.

Both the footwall and hanging wall contacts are sharp. Hanging wall rocks are mainly massive to finely-laminated, calcareous, green and maroon argillites although limestone and limestone conglomerate are present locally. As exposed in the main showing, the massive sulphides are immediately overlain by a sideritic limestone conglomerate consisting of angular limestone fragments up to several inches across in a calcareous matrix containing fine quartz and muscovite. Footwall rocks also are mainly massive to finely-laminated argillites although 50 feet of massive limestone underlain by green argillite was observed beneath massive sulphides in at least one drill hole. Footwall rocks are cut by the Black Fault, the local name for gently-dipping thrust fault zone consisting of quartzite breccia fragments in a black, highly carbonaceous matrix. In places the Black Fault forms the footwall of the massive sulphide zone.

Current Work and Results:

The 1975 program on the McMillan property consisted of detailed rock and soil geochemical surveys, electromagnetic and gravity surveys and 27 diamond drill holes totalling roughly 8,400 feet. The gravity survey outlined at least one significant anomaly and three lesser anomalies south of the McMillan deposit. The diamond drilling program centered on the deposit, was designed to provide more data on the tonnage and grade. The size of the core, BQ, was greater than that from provious work and the recovery is reported to have been much better.

PORKER	Lead
Hyland Joint Venture	95 D 5, 12
	(60°31'N, 127°52'W)

References: Gabrielse and Blusson (1969); Sinclair and Gilbert (1975, pp. 83-84); Sinclair et al (1975, pp. 153-154).

Claims: PORKER 1-74

Location and Access:

The PORKER claims lie south of Hulse (Quartz) Lake and immediately east of the McMillan Property of Liard River Mining Company Limited. Access is by fixed wing aircraft to Hulse Lake from Watson Lake, 40 miles to the southwest.

History:

The property was originally staked in 1954 as the SN claims by Liard River Mining Company, which drilled four holes totalling 1,200 feet. The PORKER claims were staked in 1973 for the Hyland Joint Venture, a consortium of Marietta Resources International Limited, Mitsubishi Metal Corporation and L.T. Harris Clay. Geological mapping and geochemical surveys were carried out in 1973 and a gravity survey in 1974.

Description:

The property is underlain by Hadrynian sedimentary rocks consisting of slate and feldspathic grit with interbedded limestone (Unit 1, Gabrielse and Blusson, 1969). The rocks strike predominantly northwest and dip northeast. Siderite-limonite gossans with disseminated pyrite and arsenopyrite occur in silicified quartzite and limonitic fault breccias associated with faults cutting quartzite and argillite. Galena and associated sulphosalt minerals have been found in widely scattered veinlets.

Current Work and Results:

Detailed gravity surveying over two anomalies outlined by 1974 surveys resulted in better location and definition of an anomaly near the northeastern edge of the property. A second anomaly was eliminated, attributed to a surveying error.

Detailed soil sampling outlined coincident lead and arsenic anomalies on the east flank of the gravity anomaly.

Four diamond drill holes totalling 994 feet were drilled to test the gravity anomaly. Two of the holes were abandoned in overburden. The other two holes encountered interbedded argillite and grit containing up to one per cent pyrite, disseminated and in fractures. Narrow quartz-calcite-siderite veinlets were also present locally.

MEL — Lead, Zinc, Barite
Granby Mining Corporation — 95 D 6
Sovereign Metals Corporation — (60°21'N, 127°25'W)

References: Gabrielse and Blusson (1969); Sinclair and Gilbert (1975, pp. 82-83); Sinclair *et al* (1975, pp. 152-153).

Claims: MEL 11-16; JEAN 1-10, 16, 18, 20; WET 1-32

Location and Access:

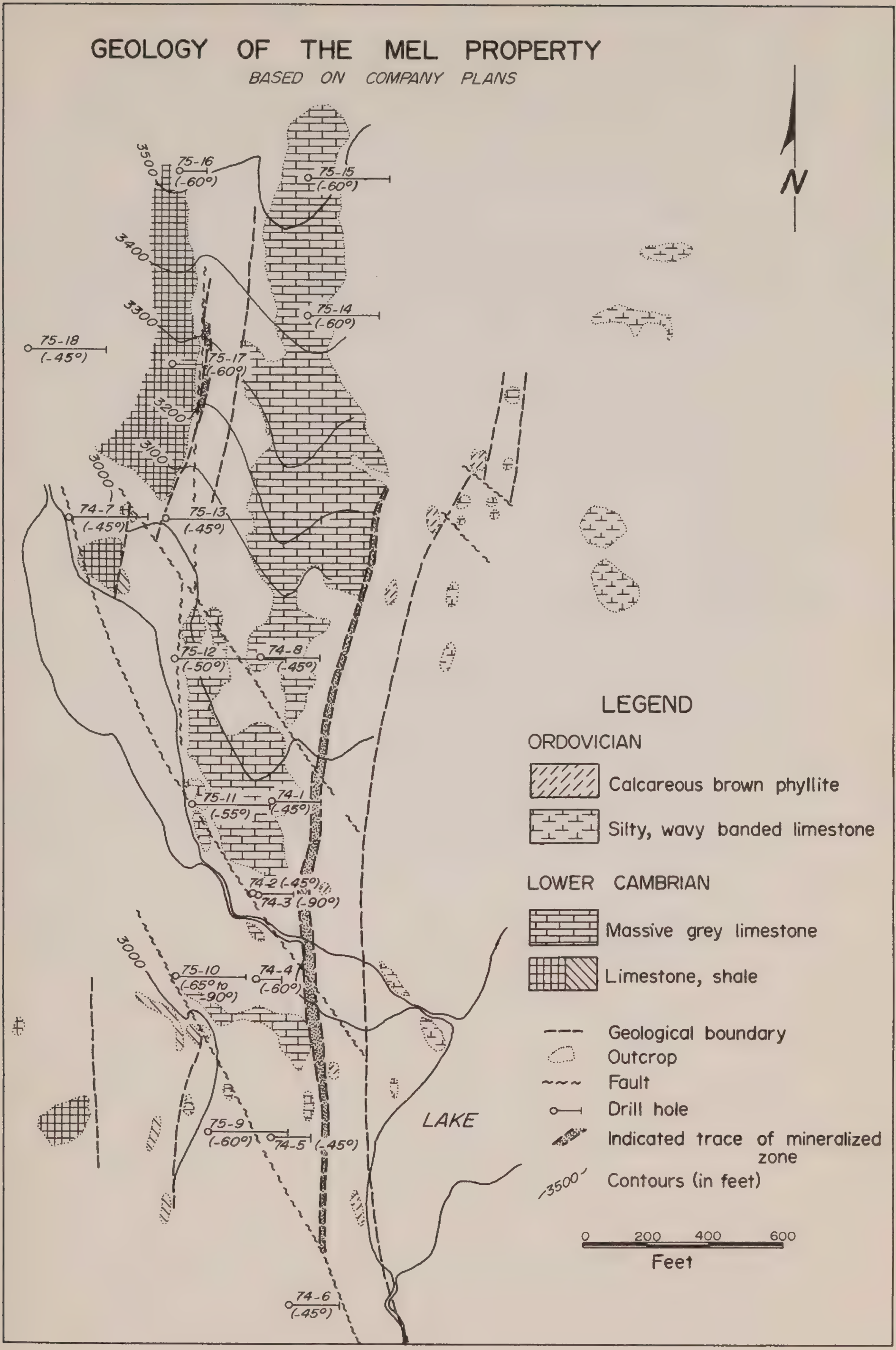
The claims are situated one and one-half miles south-southeast of Otter Lake and four miles east of the Coal River at elevations ranging from 2,900 to 3,500 feet. Otter Lake is capable of handling float aircraft from Watson Lake, 50 miles to the west-southwest. During the winter and spring of 1974-75, equipment and supplies were hauled in over a 30-mile winter road which leaves the Alaska Highway at Mile 590.

History:

The original MEL claims were staked in 1967 and optioned to Newmont Mining Corporation although the occurrence of barite with associated galena and sphalerite had apparently been known for some time. Trenching by Newmont exposed sulphides at four locations over a strike length of 1,600 feet, with assays on the order of 5.0 per cent combined lead-zinc over widths ranging from 7.5 to 30.0 feet. The claims were subsequently acquired by Empire Metals Corporation Limited (which became Sovereign Metals Corporation in 1976) and optioned to Granby Mining Corporation in 1973. In 1974, Granby drilled eight holes on the property totalling 1,799 feet.

Description:

The property is underlain by Cambro-Ordovician carbonates and argillaceous sediments which form the overturned west limb of a broad syncline. The west part of the property is underlain by massive grey limestone with interbedded shale bands of Lower Cambrian age (Unit 5, Gabrielse and Blusson, 1969). To the east, the property is underlain by calcareous brown phyllite and silty, wavy banded limestone of Ordovician age (Unit 8, op. cit.). The contact between the Lower Cambrian and Ordovician sediments appears to be conformable, striking roughly north and dipping steeply to the west.



GEOLOGY OF THE MEL PROPERTY
BASED ON COMPANY PLANS
N
75-16 (-60°)
75-15 (-60°)
75-14 (-60°)
75-18 (-45°)
75-17 (-60°)
74-7 (-45°)
75-13 (-45°)
75-12 (-50°)
74-8 (-45°)
75-11 (-55°)
74-1 (-45°)
74-2 (-45°)
74-3 (-90°)
75-10 (-65° to -90°)
74-4 (-60°)
75-9 (-60°)
74-5 (-45°)
74-6 (-45°)
3500
3400
3300
3200
3100
3000
3000
LAKE
LEGEND
ORDOVICIAN
Calcareous brown phyllite
Silty, wavy banded limestone
LOWER CAMBRIAN
Massive grey limestone
Limestone, shale
Geological boundary
Outcrop
Fault
Drill hole
Indicated trace of mineralized zone
3500
Contours (in feet)
0
200
400
600
Feet

Drilling to date has indicated a mineralized zone 10 to 40 feet wide located at the contact of massive grey limestone on the hanging wall and limy, pyritic phyllite on the footwall. The mineralized zone is a brown, baritic, limy shale containing disseminated sphalerite and galena with minor pyrite. Barite content of the mineralized zone varies locally from traces to massive sections up to 10 feet thick of almost pure barite. Both the hanging wall and footwall contacts appear to be fairly abrupt, although the latter may be gradational over several feet.

Current Work and Results:

Early in 1975, Granby carried out a program of diamond drilling totalling 4,606 feet in 10 holes and did some detailed geological mapping. Results of the 1974 and 1975 drilling indicate the mineralzed zone contains approximately 3 million tons of about 8 per cent combined lead-zinc. A summary of the 1974 and 1975 drilling is as follows:

Hole	Footage	Interval	Ag (oz/ton)	Pb (%)	Zn (%)	$BaSO_4$ (%)
74-1	121.5-145.0	23.5	0.28	2.69	6.03	65.0
74-2	111.0-155.5	44.5	0.17	2.16	4.83	63.1
74-3	202.5-233	30.5	poor recovery - fault zone			
74-4	123.0-153.0	30.0	0.04	1.15	6.28	48.3
74-5	151.0-157.5	6.5	0.06	1.95	11.52	65.6
74-6	187.5-192.5	5.0	0.15	2.02	3.11	tr.
74-7	Drilled on west zone - no mineralization					
74-8	217.5-232.5	15.0	0.05	2.87	9.00	54.5
75-9	432.0-458.0	26.0	-	1.86	6.95	63.3
	466.5-472.5	5.0	-	2.15	3.95	-
75-10	Hole deflected - no mineralization					
75-11	363.0-417	54.0	-	2.22	3.22	53.3
75-12	477.0-497	20.0	-	1.15	5.67	35.8
75-13	650.0-652.5	2.5	-	1.15	13.50	tr.
75-14		no mineralization				
75-15		no mineralization				
75-16		no mineralization				
75-17		no mineralization				
75-18	196.0-201.5	5.5	-	0.25	0.95	-

A & B
Delphi Resources Limited

Lead, Zinc, Silver
105 B 1
(60°07'N, 130°26'W)

References: Little (1959, p. 37); Poole, Roddick and Green (1960); Green and Godwin (1963, pp. 31-32); Green (1966, pp. 80-82); Craig and Laporte (1972, pp. 134-137); Craig and Milner (1975, p. 106).

Claims: A & B 1-8

Location and Access:

The claims are located stradling the main branch of Boulder Creek approximately three miles from its junction with the Rancheria River at Mile 701.6 on the Alaska Highway. The claims are reached by 2 1/2 miles of gravel road from the Alaska Highway.

History:

The property was first explored for tungsten in 1943 and has been explored several times since, but little work done on the showings since 1962. Details in Craig and Laporte (1972) and Craig and Milner (1975) under LUCK group.

Description:

The showing consists of sphalerite, galena and pyrite in recrystalized and altered limestone and limy phyllites. A fault zone cuts through the showing.

Current Work and Results:

During 1975, a geochemical soil survey and trenching were done on the property. A geochemical anomaly was found on a portion of the property where no outcrop exists. A 10 foot chip sample assayed 3.06 per cent zinc, 0.29 per cent lead and 0.64 ounces silver per ton while a grab sample ran 9.48 per cent zinc, 5.03 per cent lead and 3.28 ounces silver per ton. Angular float fragments have been found in the new trenches. Further work on the property is recommended.

BINGY
Hudson Bay Exploration and
Development Company Limited

Silver, Lead, Zinc
105 B 10
(60°35'N, 130°40'W)

Reference: Poole *et al* (1960).

Claims: BINGY 1-18

Location and Access:

The claims lie near the headwaters of Cabin Creek, 72 miles northwest of Watson Lake. Access in 1975 was by helicopter.

History:

The claims were staked in 1974 following a program of reconnaissance prospecting and soil sampling which led to the discovery of silver-lead mineralization.

Description:

The claim block area is underlain primarily by biotite-muscovite granodiorite of Jurassic and/or Cretaceous age which intrude sediments of Lower Cambrian and (?) earlier age. Galena and sphalerite, locally with high silver, are reported to occur associated with faulting in the sediments and to a lesser extent, in the intrusive rocks.

Current Work and Results:

Soil and silt sampling in 1975 outlined a number of areas warranting further work. Ground magnetic and EM-17 surveys were also conducted.

ANGIE	Silver, Lead, Zinc
Hudson Bay Exploration and	105 B 11
Development Company Limited	(60°38'N, 131°11'W)

References: Poole et al (1960); Sinclair et al (1975, p. 150).

Claims: ANGIE 1-46

Location and Access:

The claims are situated four miles northeast of Irvine Lake. Access in 1975 was by fixed wing aircraft from Watson Lake to Irvine Lake and then by helicopter.

History:

The claims were staked in July 1974 by Hudson Bay who carried out geochemical surveys and 1,485 feet of diamond drilling during the summer of 1974.

Description:

The property is underlain by muscovite and chlorite schist and gneiss of Cambrian and (?) earlier age (Unit 1, Poole et al, 1960) which are intruded by Jurassic and/or Cretaceous granodiorite (Unit 15e, op. cit.). Scattered showings of galena and sphalerite with associated silver are reported to occur in magnetite-diopside skarn developed at intrusive contacts.

Current Work and Results:

In 1975, Hudson Bay carried out detailed soil sampling, a limited I.P. survey and drilled four holes totalling 1,185 feet. The drilling is reported to have encountered scattered galena, sphalerite and associated fluorite in a partially developed limestone skarn.

SURETHING, JACKALOO
United Keno Hill Mines Limited

Copper
105 C 8
(60°20'N, 132°01'W)

Reference: Mulligan (1963).

Claims: SURETHING 1-3; JACKALOO 1-8

Location and Access:

The claims are situated on Mount McCleery in the Englishmans Range roughly 26 miles east-northeast of Teslin. The terrain is rugged and precipitous with elevations ranging from 4,500 feet to nearly 6,400 feet. Access in 1975 was by helicopter.

History:

Copper mineralization was discovered and staked early in 1974 and was subsequently optioned by United Keno Hill Mines Limited.

Description:

The property is underlain mainly by Mississippian sediments and minor volcanics of the Englishmans Group (Unit 3, Mulligan, 1963). The sequence on the property includes: limestone, tremolitic marble and dolomite; argillaceous quartzite; rusty-weathering, cherty to quartzitic and phyllitic rocks; greenish to purplish, fine-grained volcanic rocks; and light grey argillite and phyllite. The distribution and attitudes of the limestone suggest the structure is a southeast-plunging syncline complicated by faulting and minor drag folding. To the north, the Englishmans Group is intruded by Cretaceous granitic rocks of the Hake Batholith, consisting mainly of coarse-grained to porphyritic biotite granite or granodiorite (Unit 13, op. cit.).

The principal copper showings consist of bornite and chalcopyrite occurring as fracture-fillings along steeply-dipping northeast-trending fractures and as small bornite-chalcopyrite-epidote-garnet skarn zones developed at the intersection of these northeast-trending fractures and limy horizons in the sediments. Minor copper showings consist of traces of chalcopyrite and minor pyrite in quartz and calcite veins in fractures cutting argillaceous quartzite and traces of bornite and chalcopyrite with malachite in quartz veins cutting limestone and quartz-tremolite skarn.

Current Work and Results:

Field work in 1975 consisted of geological mapping and soil geochemical sampling. No significant copper occurrences were located and the three copper soil anomalies outlined were related to minor copper occurrences. Company geologists recommended termination of the option agreement.

MAT, GULL
Nithex Development and Exploration Limited

Silver, Lead, Zinc, Gold
105 F 10
(61°32'N, 132°35'W)

Reference: Wheeler *et al* (1960).

Claims: MAT 1-4; GULL 1-4

Location and Access:

The property consists of two claim blocks, roughly one mile apart, situated 29 miles south of Ross River between Seagull Creek and the McConnell River. Access in 1975 was by helicopter.

History:

Showings presently covered by the MAT claims were discovered and staked in 1966. The property was subsequently optioned by Conwest Exploration who conducted geological mapping and trenching in 1969. The MAT and GULL claims were staked in July and August 1974.

Description:

The claims are underlain by felsic volcanics of Mississippian (?) age or earlier (Unit 6c, Wheeler *et al*, 1960) which are intruded locally by small stocks of hornblende syenite (Unit 7, *op. cit.*). On the MAT claims, massive silver-bearing galena occurs in a five-foot vein striking north and dipping moderately east. The host rocks consist of highly altered and brecciated graphitic slate and foliated quartz-eye tuff containing disseminations and small lenses of pyrite. Mineralization on the GULL claims consists of irregular nests, clots and stringers of galena and, locally, minor sphalerite.

Current Work and Results:

A grab sample from the galena vein on the MAT claims assayed 19.40 per cent lead, 11.63 ounces silver per ton and 0.046 ounces gold per ton. Two grab samples from the associated host rocks in the area assayed 0.65 per cent lead, 1.8 ounces silver per ton and 0.02 ounces gold per ton and 8.70 per cent lead, 7.8 ounces silver per ton and 0.02 ounces gold per ton.

A grab sample from the area of mineralization on the GULL claims gave the following assay: 6.20 per cent lead, 0.70 per cent zinc and 1.8 ounces silver per ton.

HORN
Allen Carlos

105 F 16
(61°50'N, 132°03'W)

References: Lees (1936); Wheeler *et al* (1960a).

Claims: HORN 1-24

Location and Access:

The claims are 16 miles southeast of Ross River along the Pelly River and Campbell Highway. Access is from the highway along a bush road.

History:

The claims were staked in March 1975.

Description:

The claim group is underlain by a northwest-trending unit of limestones, cherty quartzites and argillites, with intrusive bodies of peridotite, porphyritic hornblende diorite and altered quartz diorite.

Current Work and Results:

A magnetic and EM survey were conducted over the claims. Several anomalies were outlined and a soil geochemistry survey was carried out over them. No geochemical anomalies were found. A single diamond drill hole of 200 feet encountered 152 feet of overburden. The hole was drilled down dip and the core consisted of carbonate rock that was altered in places and carried a low tenor of pyrite. Further geophysical work was recommended.

CAL GAL — 105 F 16
Welcome North Mines Limited — (61°51'N, 132°12'W)
Mackir Mining Limited

Reference: Wheeler *et al* (1960a).

Claims: CAL GAL 1-16

Location and Access:

The claims are situated on the north side of the Robert Campbell Highway at approximately 3,000 feet elevation. Access in 1975 was via the Robert Cambpell Highway from Ross River, 25 miles to the northwest by road.

History:

The claims were staked in May 1975. No previous work on the property is known.

Description:

The property lies immediately northeast of the Tintina Trench and is underlain by metavolcanics and metasediments of undetermined age (Unit A, Wheeler *et al*, (1960). Company geologists have noted the following rock types on the property: greenstone of probable basaltic composition, altered felsic volcanics, graphitic phyllite and quartz-chlorite-sericite schist. No mineral showings have been reported.

Current Work and Results:

Work on the property in 1975 consisted of geological reconnaissance, soil sampling and a gravity survey. The soil sampling outlined one area of coincident lead and zinc anomalous values. A gravity anomaly was outlined extending roughly east-west across the entire property. During November and December a vertical hole drilled to a depth of roughly 750 feet to test the gravity anomaly failed to intersect sulphide mineralization. The cause of the gravity anomaly remains unexplained.

PY
Cyprus Anvil Mining Corporation

Copper
105 G 1
(61°09'N, 130°09'W)

Reference: Wheeler et al (1960).

Claims: PY 1-24

Location and Access:

The claims are situated roughly 12 miles east-southeast of Fire Lake at elevations ranging from 4,000 to over 6,000 feet. Access in 1975 was by helicopter.

History:

The PY claims were staked in July 1975.

Description:

The property is underlain by quartzite, quartz-rich schist and quartz-sericite schist of unknown age (Unit C, Wheeler et al, 1960). Some zones of massive pyrite have been observed within quartz-sericite schist and minor copper mineralization has been found in float consisting of quartz-feldspar-sericite schist.

Current Work and Results:

Soil sampling in 1975 outlined a strong copper geochemical anomaly in an area of little or no exposed outcrop. An I.P. survey outlined an anomalous area generally coincident with the geochemical anomaly. The company plans to investigate the property further.

EAGLE
Tintina Silver Mines Limited

Silver, Lead, Zinc
105 G 3
(61°08'N, 131°10'W)

References: Wheeler et al (1960); Skinner (1962, pp. 37-39); Green and Godwin (1963, pp. 26-29); Sinclair et al (1975, pp. 156-158).

Claims: EAGLE 1-58, 66, 73, 74, 77, 78, 81-85, 115-138

Location and Access:

The main showings occur four miles west of Ings River in a north-trending cirque valley at elevations over 5,000 feet. Access in 1975 was by helicopter from Ross River, 70 miles to the west-northwest or by fixed wing to an airstrip five miles southwest of the property and thence via helicopter.

History:

The claims were originally staked by Conwest Exploration Company Limited in 1961 and subsequently acquired by Tintina Silver Mines Limited who carried out extensive underground work in 1962. In 1974, Tintina conducted an extensive drilling program on the property totalling 11,899 feet in 97 holes.

Description:

The property is underlain by Cambrian sediments (Units 1c and 2, Wheeler et al, 1960) intruded by Jurassic and/or Cretaceous granodiorite (Unit 9, op. cit.). Mineral showings consist mainly of massive to disseminated galena, sphalerite and freibergite emplaced in a limestone horizon near the contact with overlying graphitic argillite.

Current Work and Results:

Geological mapping, soil sampling, and ground magnetic and electromagnetic surveys were carried out in 1975. A number of new showings are reported to have been discovered during this work.

PELLY — Lead, Zinc
Sovereign Metals Corporation — 105 G 6
Texasgulf Inc. — (61°28'N, 131°20'W)

Reference: Wheeler et al (1960).

Claims: PELLY 1-32

Location and Access:

The claims are situated on the north side of Pearl Creek, a southwest-flowing tributary of the Hoole River. Access in 1975 was by helicopter from Ross River, 52 miles to the northwest.

History:

The discovery of lead-zinc mineralization in the mid 1960's led to the staking of the property as the EL claims. During 1966 and 1967, Northlake Mines Limited carried out extensive exploration including approximately 1,000 feet of diamond drilling in four holes. Drill hole No. 1 intersected 37 feet assaying 0.6 per cent lead and 0.6 per cent zinc and drill hole No. 3 encountered 0.3 per cent lead and 0.2 per cent zinc over 7 feet. The EL claims subsequently lapsed and were restaked as the PELLY claims in June 1974, and March and June 1975.

Description:

The area is underlain mainly by schistose rocks of probably Proterozoic age (Unit A, Wheeler et al, 1960). The principal rock types exposed on the property consist of chlorite-graphite schist, feldspar augen schist and quartz-sericite schist. Dunite of probably Paleozoic age (Unit D, op, cit.) is exposed northwest of the property. The regional strike of the schistosity is to the northwest, with gentle dips to the southwest. More complex structural relationships are represented locally by two or more directions of strong foliation.

Mineral occurrences on the property consist of blebs and disseminations of galena, sphalerite and pyrite within conformable bands in feldspar augen schist at or near the contact with overlying chlorite-graphite schist. One grab sample from a trench on the main showing assayed 26.8 per cent lead, 0.45 per cent zinc and 0.6 ounces per ton silver.

Current Work and Results:

Soil sampling carried out in 1975 confirmed and extended the geochemical anomaly found by earlier work. Zinc values indicate an anomalous zone up to 2,800 feet long and 400 feet wide and anomalous lead values coincide with the west-central portion.

MONEY
Cyprus Anvil Mining Corporation

Lead
105 G 8
(61°17'N, 130°11'W)

Reference: Wheeler et al (1960).

Claims: MONEY 1-32

Location and Access:

The property lies 13 miles east-northeast of Fire Lake and 4 miles south of Money Creek. Elevations on the property range from 4,500 to over 6,000 feet. Access in 1975 was by helicopter.

History:

The MONEY claims were staked in June 1975.

Description:

The area is underlain by a relatively flat-lying sequence of schists containing some magnetite-rich horizons (Unit a, Wheeler et al, 1960). Very minor galena was found in thin, discontinuous lenses of quartz-graphite schist.

Current Work and Results:

Soil sampling and a ground magnetometer survey carried out in 1975 failed to outline any anomalous areas of significant interest.

BEV
Hudson Bay Exploration and
Development Company Limited

105 G 11

Reference: Wheeler et al (1960).

Claims: BEV 1-338

Location and Access:

The claims are situated in ten separate groups lying up to several miles apart south of the Campbell Highway. Access in 1975 was by fixed wing and helicopter aircraft from Ross River and by tractor roads late in the season during the drilling program.

History:

The claims were staked during the fall of 1974.

Description:

Outcrop exposure on all the claim groups is very poor although the regional mapping indicates the area is likely underlain by metamorphic rocks of probable Lower Paleozoic age consisting of biotite and chlorite schists (Unit A, Wheeler et al, 1960). In the eastern part of the area these rocks are intruded by granitic rocks of Jurassic and/or Cretaceous age (Unit 9, op. cit.). No mineral occurrences have been reported although the underlying rocks are thought to be generally correlative to the schists and phyllites which host the massive lead-zinc deposits of the Anvil Range to the northwest.

Current Work and Results:

Airborne surveys conducted in 1974 outlined a number of electromagnetic anomalies. In 1975, ground magnetic and EM-17 surveys were carried out on all claim groups and 2,359 feet of diamond drilling in 7 holes was conducted on five of the claim groups (BEV 1-32; 151-162; 327-338; 166-181; 182-197 and 163-165; 254-309. The drilling is reported to have intersected mainly flat-lying graphitic schists with minor disseminated pyrite. One of the holes, drilled on a magnetic anomaly, encountered serpentinite with minor pyrite.

BOB — Lead, Zinc, Copper
Ogilvie Joint Venture — 105 G 15
(61°56'N, 130°32'W)

Reference: Wheeler et al (1960).

Claims: BOB 1-16

Location and Access:

The claims are situated approximately one and one-half miles east of the south end of Fortin Lake. Access in 1975 was by helicopter from Ross River, 60 miles to the west.

History:

The property was originally staked as the ZN and PHIL claims to cover zinc-lead mineralization discovered in 1967. In 1967 and 1968, Atlas Explorations Limited carried out bulldozer trenching on the showing and geophysical and geochemical surveys over the property. The BOB claims were staked in August 1974.

Description:

Rocks in the vicinity of the main showings consist of quartz-sericite phyllite of probable Cambrian or Ordovician age, striking approximately east-west and dipping 25° to 55° to the south.

Two showings are present on the property. The first consists of one-quarter- to one-inch quartz veins containing small amounts of chalcopyrite, galena and sphalerite. These mineralized quartz veins occur at roughly one-foot intervals over a distance of 32 feet. The second showing consists of a vein one and one-half feet wide and 20 feet long containing 30 to 40 per cent dark brown sphalerite with minor galena and chalcopyrite.

Current Work and Results:

Work in 1975 included geological examination and a soil geochemical survey of the BOB claims. Chip sampling was carried out on the two main showings.

SUSAN
Union Carbide Canada Mining Limited

Tungsten
105 H 8
(61°26'N, 128°18'W)

Reference: Blusson (1966).

Claims: SUSAN 1-38

Location and Access:

The claims are situated roughly four miles southwest of the Hyland River bridge on the Nahanni Range Raod, approximately 96 miles north-northeast of Watson Lake. Elevations on the property range from 3,500 to over 6,000 feet. Access in 1975 was by helicopter.

History:

The SUSAN claims were staked in June and August 1975 during a regional exploration program.

Description:

The property is underlain by Cambrian and/or earlier quartz-feldspar schist and gneiss locally containing horizons of fine- to coarse-grained marble (Unit 2 and 2a, Blusson, 1966). These rocks are intruded to the west by granitic rocks of Cretaceous age (Unit 15, op. cit.) with skarn developed locally along the contact. Minor occurrences of scheelite have been observed in the skarn zones.

Current Work and Results:

Work carried out in 1975 included geophysical surveys along with two Winkie diamond drill holes totalling 492 feet. The drilling is reported to have encountered skarn carrying minor amounts of scheelite.

HOWARDS PASS*
Canex Placer Limited
United States Steel Corporation

Lead, Zinc
105 I 6, 11, 12
(62°27'N, 129°11'W)

References: Green et al (1967); Blusson (1968); Gabrielse et al (1973); Craig and Milner (1975, p. 124); Sinclair and Gilbert (1975, pp. 85-90); Ludvigsen (1975); Sinclair et al (1975, pp. 159-160).

Claims: DON; OP; R; X; Y; ANNIV: total of 444 claims

Location and Access:

The property is situated in the Selwyn Mountains along the Yukon-Northwest Territories border, 100 miles east-northeast of Ross River and 160 miles north of Watson Lake. The main showings on the property are at elevations of 5,000 to 6,000 feet. Access in 1975 was primarily by fixed wing aircraft from either Ross River or Watson Lake to an 1,800-foot airstrip on the property. Heavy equipment can be brought to the property via a winter tote road which leaves the Nahanni Range Road at Mile 101.

History:

High grade showings of lead and zinc were discovered by Canex Placer following geochemical surveys carried out in 1968 and 1971. In 1973 and 1974, the company carried out extensive surface exploration including 38 diamond drill holes totalling over 20,000 feet.

Description:

The property is underlain by Paleozoic sediments consisting of, from oldest to youngest: Upper Cambrian and (?) Ordovician limestone, locally referred to as the "wavy-banded" limestone, (Unit 7b, Green et al, 1967); up to 1,000 feet of black, graphitic and graptolitic shales of the Ordovician Road River Formation (Unit 10, op. cit.); and over 3,000 feet of siliceous shale, sandstone and chert-pebble conglomerate of Devono-Mississippian age (Unit 18, op. cit.). Extremely fine-grained galena and sphalerite occur in thin, conformable laminae in a black, graphitic horizon in the Road River Formation, roughly 200 feet above the lower contacts with the "wavy-banded" limestone. Secondary lead-zinc minerals such as smithsonite, cerussite and particularly hydrozincite have been observed in surface showings.

Current Work and Results:

The 1975 program on the property included detailed geological mapping, trenching and 14 diamond drill holes totalling roughly 13,000 feet.

KATE* — Copper, Lead, Zinc
Welcome North Mines Limited — 105 J 2, 7
(62°15'N, 130°41'W)

References: Skinner (1961, p. 43; 1962, pp. 30-31); Green and Godwin (1963, pp. 30-31); Roddick and Green (1961b).

Claims: KATE 1-96

Location and Access:

The KATE claims are situated roughly 12 miles north-northwest of Traffic Mountain and 60 miles northeast of Ross River. Access in 1975 was by fixed wing aircraft from Ross River to a small lake at the northeast corner of the property. The mineral showings occur at elevations ranging from 4,200 to 5,500 feet.

History:

Copper showings were discovered in 1956 by Kennco Explorations Limited who staked the IKE claims and conducted a limited examination of the property. Yukon Canadian Mining Limited restaked the property as the NORKEN, FOOL, PEAK and RAIN groups in 1959 and subsequently carried out geochemical and geophysical surveys, trenching and roughly 4,600 feet of diamond drilling. The property was restaked in 1966 as the EM and EMU claims and optioned to Atlas Explorations Limited, who carried out soil sampling. Welcome North Mines Limited staked the KATE claims in January 1975.

*Visited by D.B. Craig

Description:

Outcrop on the property is sparse and consists mainly of chert and shale underlain by limestone. The underlying limestone, locally referred to as "wavy-banded" limestone consists of thick-bedded limestone in the lower part of the section and contains sandy lenses in the upper part of the section. Roddick and Green (1961b) include all the rocks in the area within their Unit 3 of Ordovician to Silurian age, but the "wavy-banded" limestone is considered to be older and probably belongs to Unit 1 of Cambrian age. The "wavy-banded" limestone is unconformably overlain by the Ordovician-Silurian Road River Formation comprised mainly of recessive, black, graphitic shale overlain by white, green purple and brown interbanded chert and cherty shale. The sediments have been isoclinally folded about west- to northwest-trending axes and are generally steeply dipping.

Mineral occurrences on the KATE property consist of copper showings and lead-zinc mineralization encountered in float. The copper showings consist of chalcopyrite with pyrite and pyrrhotite and minor galena and sphalerite. The sulphides occur in banded chert and cherty shale disseminated along bedding and in crosscutting fractures. Three separate showings (designated Nipple, Copter and Peak) have been recognized over a strike length of 6,000 feet and scattered occurrences of copper in float extended the probable zone of mineralization for over 8,000 feet.

Lead and zinc mineralization has been found in float only and consists of banded sphalerite and galena in black shale. The shale is thought to belong to the Road River Formation, which is recessive and largely overburden covered in the porperty area.

Current Work and Results:

Geochemical soil sampling was conducted in 1975 to further delineate the copper zone and to attempt to locate and delineate the lead-zinc mineralized zone. Coincident copper, lead and zinc anomalies 5,000 feet long were found in the vicinity of the Peak showing and strong coincident anomalies were found roughly 4,000 feet east of the Peak zone. Several discontinuous lead anomalies were outlined in areas possibly underlain by Road River shale.

COAL REPORTS

TANTALUS BUTTE MINE
Cyprus Anvil Mining Corporation

Coal
115 I 1
(62°08'N, 136°16'W)

References: Bostock (1936, pp. 59-62); Green (1966, pp. 121-124); Findlay (1967, p. 88; 1969a, p. 15; 1969b, pp. 66-67); Craig and Laporte (1972, pp. 155-156); Sinclair and Gilbert (1975, pp. 121-122); Sinclair *et al* (1975, p. 168).

Lots and Leases: Leases 2955, 2959; Lots 23, 24

Location and Access:

The mine is situated on the north bank of the Yukon River, four miles north of Carmacks and less than one-half mile from the Whitehorse-Mayo Road.

History:

The Tantalus Butte Mine began operation in 1923, supplying coal to Carmacks and Dawson and later the mill at United Keno Hill Mines, Elsa, until 1967. In 1969, the mine began supplying coal to the Anvil Mine where it is used for plant heating and concentrate drying.

Description:

The coal occurs in the Tantalus Formation of Upper Jurassic (?) and Lower Cretaceous age, consisting of conglomerate with lesser amounts of sandstone, shale and a few coal seams. The main seam ranges from 8 to 10 feet thick, strikes north and dips 45° to 70° west. The seam is displaced by steeply-dipping, northeast- to northwest-trending faults. Although fault displacement is only on the order of a few feet or more, mining is rendered difficult. The coal is a high volatile, bituminous coal with calorific value ranging from 11,000 to 12,700 BTU. Samples are agglomerating with a swelling index of 1 (ASTM) and are not suitable for metallurgical grade coke (Green, 1966, p. 124).

Current Activities:

During 1975, the mine produced a total of 16,123 tons from underground at a daily rate of 63 tons. In addition, 9,589 tons were mined from a surface strip roughly one-third of a mile north of the present mine workings. The coal from the surface strip has a lower calorific value than that from underground and has probably undergone some weathering. The coal was back hauled by ore trucks on their return to the Anvil Mine.

PLACER REPORTS

- Properties visited by D.B. Craig unless otherwise indicated.

SIXTYMILE AREA

(1) J. Lynch — 116 C 2
Glacier Creek — (64°02'N, 140°53'W)

J. Lynch, with one employee, using a D-7 bulldozer, a 2,500 gpm pump producing a 140-foot head, and a monitor, continued mining Grimard Discovery claim on Upper Glacier Creek, 2 miles above its mouth. The creek was extensively hand mined for years following the discovery of gold on it in 1893. During the 1940's and 1950's bulldozer mining was done. In 1975 Mr. Lynch put in a right limit cut of roughly 13,000 bedrock square feet between the earlier bulldozer tailings and a silt bank 40 feet high. Following stripping of overburden, the mining method is to monitor the gravel to remove fines, then push the material to the sluice box with the bulldozer. 1975 production was reported to be approximately 400 crude ounces of gold. The mined section is approximately 8 feet thick, consisting of fairly angular quartz-mica schist and quartzite lying on a rusty weathering, partly decomposed quartz-mica schist bedrock. The top 2 feet of this bedrock carries abundant pay and is being mined with the gravel.

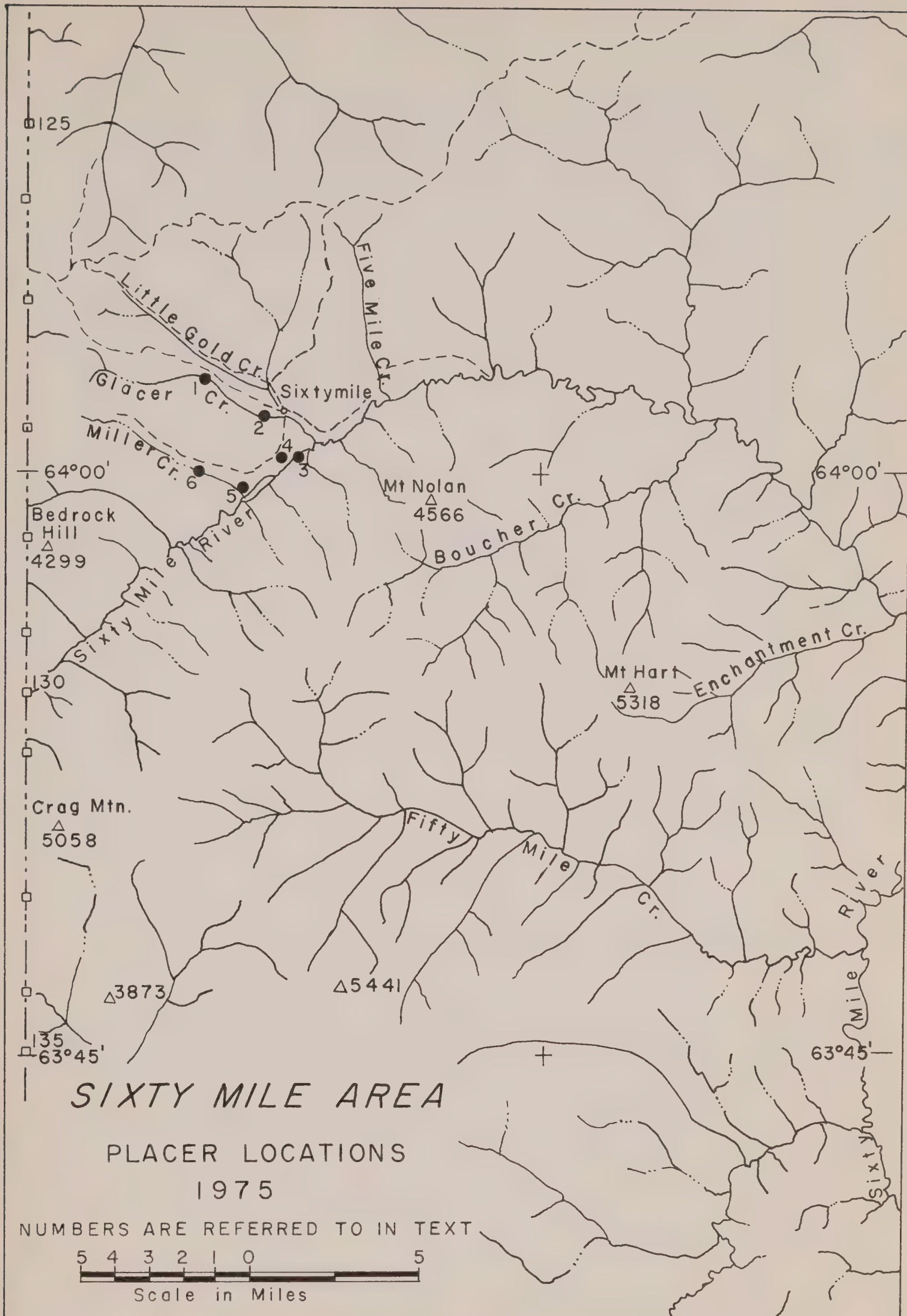
(2) Glacier Creek Placers — 116 C 2
Glacier Creek — (64°02'N, 140°49'W)

Principals L. Grimard and E. Faucher, working with one other man, mined on claims 9 and 10 on Glacier Creek, recovering 212 crude ounces gold from a cut of 10,000 bedrock square feet on claim number 9. Much of the work involves stripping of some 30 feet of fine grey silt muck before sluicing the gold bearing section of 8 feet of gravel and bedrock. They also mined on Big Gold Creek, north of their Glacier Creek workings, pumping water from a tributary, Little Gold Creek, for the operation, and recovered 80 crude ounces of gold. They normally mine the gravels with 2 D-6 bulldozers and contract much of the stripping of the silts to an operator using a D-8.

(3) Cogassa Mining Corporation Limited — 116 C 2
Sixtymile River — (64°01'N, 140°42'W)

This company holds 44 miles of placer leases on the Sixtymile River under purchase agreement with W. Hakonson of Dawson City and 5-mile leases on the lower ends of Sixtymile tributary creeks California, Fish, Enchantment, Boucher and Fifty Mile. It also holds the Canadian portion of the Fortymile River from Clinton Creek to the Alaska Border, a total of 36 miles of stream placer leases.

The 1975 operations consisted of a series of left limit cuts on the Sixtymile upstream from the mouth of Glacier Creek. Working with three International TD 25 C bulldozers and three rubber tired Payloaders of 2 1/2 and 3 1/2 yard capacity, the company put in 8 cuts, each roughly 200 feet by 200 feet, totalling 120,000 cubic yards, and recovering 2,500 crude ounces gold. Four of these cuts were side by side away from the river, demonstrating the paystreak to be 800 feet wide; it is believed to be up to 900 feet wide on this left side of the river. The unconsolidated section here consists of gravel up to 12 feet deep overlain by 3 feet of black, silty muck. Early records show production from hand mining from 1893 to 1898.


125
Little Gold Cr.
Five Mile Cr.
Glacer Cr.
1
Sixtymile
2
Miller Cr.
4
3
6
5
64°00'
Bedrock Hill
4299
River
Sixty Mile
Mt Nolan
4566
Boucher Cr.
130
Mt Hart
5318
Enchantment Cr.
Crag Mtn.
5058
Fifty Mile Cr.
River
Mile
3873
5441
135
63°45'
Sixty
SIXTY MILE AREA
PLACER LOCATIONS
1975
NUMBERS ARE REFERRED TO IN TEXT
5 4 3 2 1 0 5
Scale in Miles

(4) Fellhawk Placers 116 C 2
Sixtymile River (64°01'N, 140°41'W)

G. Hakonson and J. Fellers of Dawson City, working with one TD 18 and one D-8 bulldozer mined four cuts totalling 35,000 bedrock square feet from the Sixtymile left limit bench immediately upstream from the mouth of Glacier Creek. The section consists of 15 feet of gravel overlain by 3 feet of muck. Process water is pumped from Big Gold Creek.

(5) Brisboise Brothers 115 N 15
Miller Creek (63°59'N, 140°49'W)

These four men hold Discovery Claim and #1 and #2 B.D. on Miller Creek. Using a D-7, D-9 and Case 1150 they mined on Discovery Claim near the junction of Miller Creek and the Sixtymile River, putting in a cut 200 feet long, 70 feet wide and to 60 feet deep. The section consists of poorly sorted gravel with a thin cross-bedded sand layer 15 feet up from the bottom. Bedrock consists of a decomposed andesite. Only the bottom 8 feet of gravel is sluiced.

(6) Sixtymile Enterprises 115 N 15
Sixtymile River (63°59'N, 140°47'W)

Owner W. Yaremcio, working with monitors and a D-7 bulldozer, completed mining of the Sixtymile bench between Big Gold and Miller creeks which he has mined since 1971. The 5-foot section of pay gravels is overlain by an organic rich muck section containing slide rock up to 20 feet thick.

Working with the Brisboise Brothers, the group began stripping in late September for a left limit cut 300 feet long by 150 feet wide on Miller Creek, 2 miles above the mouth. Preparation involved removal of about 10 feet of slate slide rock and overburden pushed over from earlier bulldozer mining. The paystreak on upper Miller Creek is deeply buried, but on basis of testing so far, is believed to be rich.

(7) Oak Bay Manor and Ten Mile Mining Limited 115 N 8
Ten Mile Creek (63°35'N, 140°05'W)

Reference: Sinclair and Gilbert (1975, p. 147).

This operation, managed by J. Edgar of Dawson City, mines on Ten Mile Creek roughly two miles up from the junction with the Sixtymile River. Operations started in 1973 on ground held by Mr. J. Sestak.

During 1975 the company put in a right limit cut roughly 500 feet wide by 700 feet long, the width being perhaps two-thirds of the mineable width of the valley. Of the section, four feet of muck and two to three feet of gravel is stripped and the lower gravel, to a maximum of 30 feet, and 2 feet of bedrock, is sluiced. Bedrock on the portion of the creek valley mined in 1975 is a white, medium grained marble. The gold at the marble bedrock is typically coarse. In the gravel a few boulders exceed three feet in largest dimension, but most material is less than one foot.

1974 operations were immediately upstream from those of 1975.

Equipment used was two D-8 bulldozers.

KLONDIKE AREA

(1) K. Tatlow
Hunker Creek
116 B 3
(64°01'N, 139°09'W)

Reference: Sinclair et al (1975, p. 170).

During 1975, this operator mined a left limit bench about 10 feet above present creek bed level on lower Hunker Creek, close against the steeply rising hillside. A strip 600 feet long by about 60 feet wide was sluiced, using a D-8 bulldozer.

(2) Miben Mining Limited
Hunker Creek
116 B 3
(64°00'30"N, 139°06'W)

Reference: Sinclair et al (1975, p. 170).

M. Stutter and B. Warnsby continued mining bench claims on Dago Hill on the left limit of Hunker Creek. They use pump driven monitors as the main mining equipment, supported by a D-6 bulldozer, to sluice the entire section, which in places exceeds 100 feet as mining advances into the hill. In the two cuts, the gravel near the base differs from the main white quartz gravels. The material, although quartz rich, is rusty-brown coloured and slightly cemented, thus more resistent to monitoring and also has boulders up to three feet in largest dimension, in contrast with the approximate 6-inch maximum of the White Channel boulders.

(3) I. Bremner
Last Chance Creek
116 B 3
(64°00'N, 139°07'W)

Reference: Sinclair et al (1975, p. 171).

Mr. Bremner, using a 4-inch monitor gravity fed from a ditch and 10-inch diameter pipe, worked the same claim as in 1974. White Channel gravels up to 50 feet thick, on what is called Bryan Bench, on the left limit of Last Chance Creek, were moved to the sluice by the monitor. In one and one-half months during the season, 5,000 bedrock square feet were mined. The bench, formerly very rich, was intensively hand mined, as indicated by the numerous shafts and drifts exposed by the present monitoring.

(4) A. Kosuta
Eighty Pup
116 B 3
(64°00.5'N, 139°05'W)

Reference: Sinclair et al (1975, p. 171).

Mr. Kosuta holds four claims on Eighty Pup, a left limit tributary of Hunker Creek, two claims on Hestor Creek and one claim on Independence Creek. During 1975 he put in one cut 80 feet long and up to 70 feet wide in the narrow canyon of Eighty Pup. The upper section consists of some 25 feet of fine silt muck which is removed by monitor. Pay gravels up to 5 feet thick lie on fractured andesite bedrock. The creek has been extensively hand mined with closely spaced cribbed shafts and drifts now being exposed by the removal of the surrounding muck. In places all the gravel section was removed by the early miners, leaving the muck resting on bedrock with no pay gravel present. Remains of Pleistocene animals are fairly common, including large ivory tusks.

On Hestor Creek, Kosuta did preparatory stripping and put down three Becker drill holes, demonstrating the gravels there to be 18 to 22 feet thick. Old workings are common on these claims also.

On his Independence Creek claim, Kosuta dug a ditch from the creek to his planned sluicing location.

(5) O. and M. Lunde — 115 O 15
Gold Bottom Creek — (63°57'N, 138°59'W)

Reference: Sinclair *et al* (1975, p. 170).

As in previous years, Mr. and Mrs. Lunde mined their claims on Gold Bottom Creek. Working on Claims 13 and 14 above the mouth with a D-7 bulldozer and a 3 cubic yard capacity front end loader, they mined 28,000 bedrock square feet. The section consists of brown to grey silty muck 5 to 12 feet thick which is stripped. Rusty brown gravels 7 to 8 feet deep are sluiced.

(6) M. and D. Crockett — 115 O 15
Gold Bottom Creek — (63°55'N, 138°59'W)

Reference: Sinclair *et al* (1975, p. 172).

Mr. and Mrs. Crockett put in 5 centre cuts totalling 62,000 bedrock square feet on the upper part of Gold Bottom Creek, each about 140 feet wide. The ground has some 6 feet of muck and 4 to 10 feet of gravel, averaging 6 feet. They strip the muck and most of the gravel, sluicing the remaining gravel and the top 4 feet of bedrock. Normally, the coarsest gold is recovered in the areas of blocky fracturing gneissic bedrock. However, in the area mined in 1975 the coarsest gold occurred in an area of chlorite schist bedrock.

(7) J. Erickson — 115 O 15
Hunker Creek — (63°56'N, 138°54'W)

Reference: Sinclair *et al* (1975, p. 172).

J. Erickson continued mining Claim 1 A/D on Hunker Creek. Using a pump driven monitor he strips 35 feet of organic rich silt muck containing numerous Pleistocene bones. The remaining gravels, 2 to 3 feet thick are moved to the sluice box with a TD-18 bulldozer and front-end loader.

(8) G. Crawford — 115 O 15
Hunker Creek — (63°54'N, 138°54'W)

Reference: Sinclair *et al* (1975, p. 172).

During the 1975 season, Mr. Crawford finished his mining on the right fork of Hunker Creek, stripping 25 feet of muck and sluicing 5 feet of gravel from 4,000 bedrock square feet on claim 26. Production was 97 crude ounces gold.

(9) P. Erickson — 115 O 15
Hunker Creek — (63°54'N, 138°53'W)

Reference: Sinclair *et al* (1975, p. 172).

This operator mined an area of 4,000 bedrock square feet in 1975 with a paystreak 60 feet wide. Muck forms the top 12 feet of a 15 foot section of overburden. One foot of pay gravel and one foot of bedrock are sluiced using a D-4 traxcavator and a D-8 part time.

(10) A. and N. Burgelman 115 0 15
Dominion Creek (63°50'N, 138°49'W)

Mr. and Mrs. Burgelman continued their bulldozer-sluicing mining on Caribou Creek, a right limit tributary of Dominion Creek.

(11) A. and N. Sailer 115 0 15
Dominion Creek (63°48'N, 138°36'W)

Reference: Sinclair et al (1975, p. 173).

The Sailers put in two cuts on Dominion Creek about 2,000 feet downstream from the mouth of Nevada Creek, totalling 45,000 bedrock square feet with a D-8 bulldozer. The mined area is a left limit bench 15 to 20 feet above Dominion Creek. The section consists of 15 feet of grey silt and 12 feet of gravel of which the lower 6 feet is sluiced.

(12) R. Rintoul 115 0 15
Dominion Creek (63°45'N, 138°31'W)

D. Rintoul with two hired men operated a dragline-bulldozer-sluice system on lower Dominion Creek. In an area where the pay gravels are well below water level and no bedrock drain is possible, Rintoul put in a right limit cut 200 feet long by 50 feet wide to 15 feet deep at right angles to Dominion Creek. The main dragline, with a crescent scraper bucket, draws out the gravels. A D-4 bulldozer then feeds these to the sluice-box; a small dragline is used to stack tailings.

(13) R. and B. Gibson 115 0 15
Sulpher Creek (63°47'N, 138°54'W)

Reference: Sinclair et al (1975, p. 174).

Mr. and Mrs. Gibson continued mining on Friday Gulch, a left limit tributary of Sulpher Creek. They mined between earlier dredge tailings and the left bank of the gulch. Muck consisting of 10 to 15 feet of grey-brown silt is stripped by bulldozer; the lower few feet of gravel and decomposed quartz-muscovite schist bedrock is sluiced.

(14) K. Djukestein and L. Gatenby 115 0 15
Sulpher Creek (63°50'N, 138°55'W)

Starting in 1974, using a system of 12 cubic yard highway scrapers which makes possible the economic transport of gravel up to 1,000 feet, Djukestein in 1975 mined a zone 1,200 feet long by 200 feet wide. A D-7 and D-8 bulldozer are used in preparing the ground and stacking tailings. A 1 1/2 yard dragline is also used to stack tailings. The present ground was stripped in the early 1960's by the Yukon Consolidated Gold Corporation. The present remaining section, 15 feet thick is stripped further with the scrapers and the bottom 7 to 8 feet delivered to the sluice.

(15) Ballarat Mines Limited
Quartz Creek
115 0 14
(63°47'N, 139°06'W)

Reference: Sinclair et al (1975, p. 173).

Ballarat Mines Limited, owned by Mrs. H. Schmidt and operated by herself and sons Stewart and Craig, mined on the right limit of Quartz Creek using two D-8 bulldozers and D-8 tractor mounted elevator. The area mined, 520 feet long by 130 feet wide and up to 60 feet deep, was completely in gravel. The upper 50 feet was stripped as waste, the lower 10 to 12 feet sluiced.

(16) R. and L. Mining Company
Quartz Creek
115 0 14
(68°48'N, 139°04'W)

Reference: Sinclair et al (1975, p. 174).

J. Lacross and W. Rasmusson continued mining on the right limit of Quartz Creek below the mouth of Little Blanche Creek, putting in three cuts, totalling roughly 125,000 bedrock square feet in a strip 550 feet long and approximately 200 feet wide. Equipment in use was two D-9 bulldozers, one D-8 and a one and one-half cubic yard capacity dragline. The section consists of some 15 feet of silt containing gravel layers, which is stripped. The lower 5 feet of gravel and one foot of strongly foliated biotite gneiss bedrock is sluiced.

(17) J. Lamontagne
Eldorado Creek
115 0 14
(63°51'N, 139°15'W)

Reference: Sinclair et al (1975, p. 170).

Mr. Lamontagne continued mining his claims on Upper Eldorado during 1975, putting in a cut at the mouth of Chief Gulch 250 feet long by 100 feet wide. He mined a section of 15 to 20 feet of angular gravel and 2 to 3 feet of the bedrock, a muscovite-chlorite schist with abundant quartz augen. He also mined two cuts of the top foot or so of bedrock exposed between tailings piles from earlier mining farther downstream on Eldorado from Chief Gulch.

(18) R. Johnson
Eldorado Creek
115 0 14
(63°53'N, 139°20'W)

Two Johnson brothers mined on Claim No. 11, Eldorado Creek, immediately below the mouth of Gay Gulch, beginning a sluicing operation using a pump capable of providing 700 to 800 gallons per minute at 160 psi pressure. They mined White Channel gravels on a left limit bench about 140 feet above the creek.

(19) A.M. and D. Fry
Eldorado Creek
115 0 14
(63°55'N, 139°18'W)

This family mining operation continued during 1975 on Eldorado Creek. They put in a narrow cut 800 feet long on claims 5 and 6 above the mouth of Eldorado Creek. A left limit bench some 15 feet above the creek has 12 feet of ice rich silt overlying what had been about 6 feet of pay ground. Although thoroughly hand mined earlier in the Klondike history, remnant pillars and small patches of gravel around posts, shafts, etc, are sufficiently rich to make more modern mining possible.

Early in the season, using snow run-off, D. Fry sluiced briefly on Gold Hill. They worked on Monte Cristo and King Solomon's hills during May.

(20) B. Bryant, B. Hill — 115 0 14
Bonanza Creek — (63°55'N, 139°16'W)

Mr. Bryant holds two claims on Upper Bonanza at the mouth of Gauvin Gulch but worked the 1975 season on Gauvin Gulch claims by arrangement with Bruce Hill. Using two D-8 bulldozers, a series of right limit cuts were made in White Channel gravels which form a bench on the right limit of Gauvin Gulch.

(21) F. Perret — 115 0 14
Bonanza Creek — (63°55'N, 139°13'W)

Reference: Sinclair *et al* (1975, p. 170).

Mr. F. Perret continued mining at the same location as in 1974, on Lucky Claim (No. 40 on upper Bonanza) down from the mouth of Victoria Gulch. Using a TD-18 bulldozer, he sluiced the lower 2 feet of the gravel-muck section, putting in a right limit cut 100 feet long by 75 feet wide, sluicing 30 hours and stripping muck with the automatic gate system for 50 hours. Gold recovery was 120 crude ounces.

(22) D. Coombs — 115 0 14
Bonanza Creek — (63°48'N, 139°08'W)

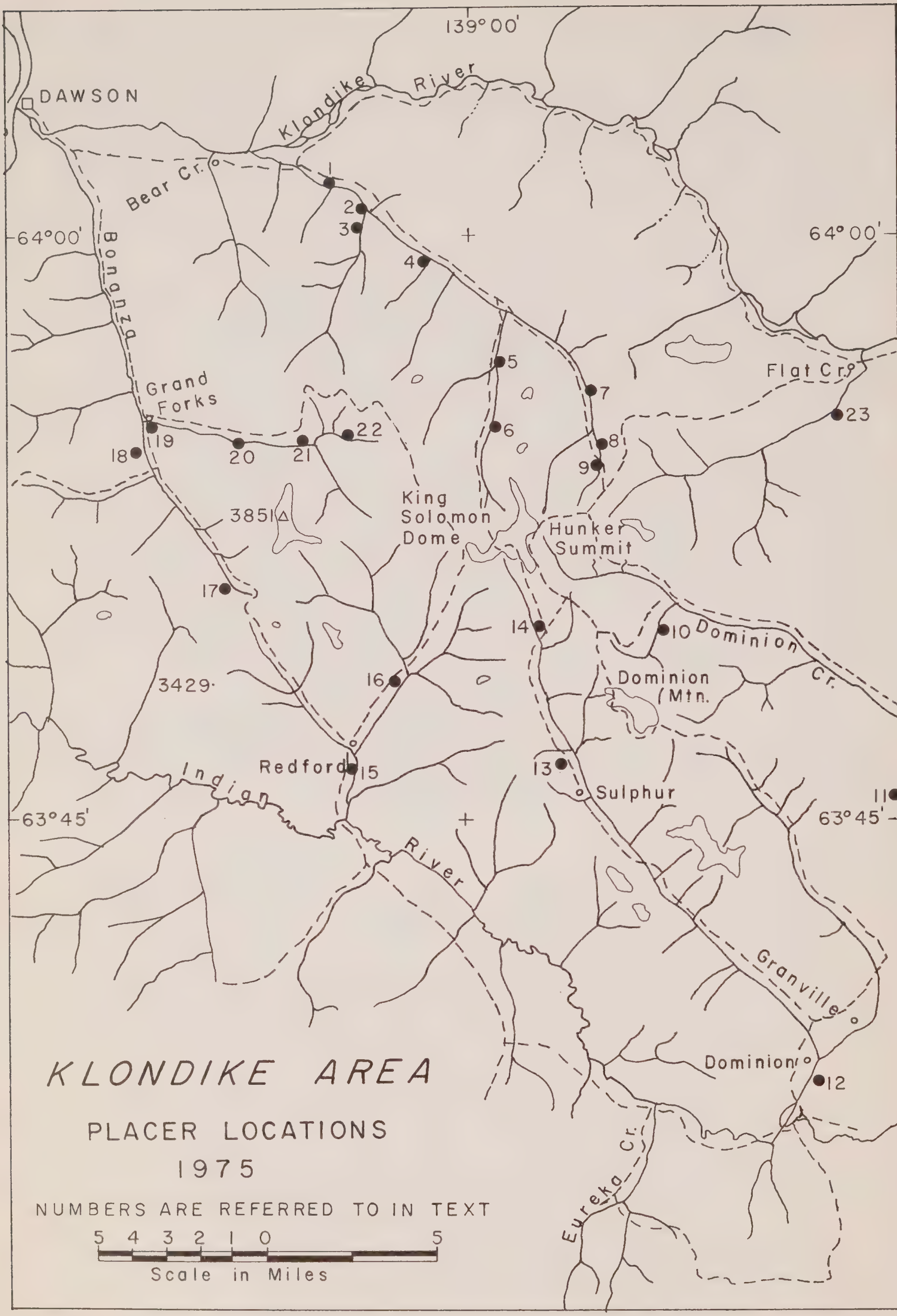
Mr. Coombs operates on Ready Bullion Gulch and Upper Bonanza Creek immediately downstream from Ready Bullion. During 1974 he staked three claims on Upper Bonanza and three claims up from the mouth of Ready Bullion. He mined partly by hand and partly with a D-4 bulldozer and concrete sluice box. In 1975 he added a further three claims on Ready Bullion and a one-mile prospecting lease on the centre fork of Upper Bonanza. During 1975 mining was at the mouth of Ready Bullion and downstream on Upper Bonanza where he put in a right limit cut 400 feet long by 20 feet wide.

The valley is narrow with little overburden and little stream gravel. The unconsolidated section consists of 3 to 4 feet of angular schist and gneiss fragments overlain by 5 feet of brown, silty soil containing slide rock fragments. Bedrock is a fractured muscovite-quartz schist. Gold is rough and coarse.

(23) K. and S. Placers — 115 0 15
Allgold Creek — (63°56'N, 138°37'W)

Reference: Sinclair *et al* (1975, p. 172).

Kinakins put in cuts on claims 4 and 6 above the mouth of Allgold Creek, 50 feet by 150 feet and 75 feet by 380 feet. Of the section, 20 feet of muck and the top 6 feet of gravel is stripped; the lower 5 feet of gravel is sluiced. Equipment used in one D-7 and one International TD-18.



KLONDIKE AREA

PLACER LOCATIONS
1975

NUMBERS ARE REFERRED TO IN TEXT

(24) Territorial Gold Placers Limited
Black Hills Creek

115 O 6, 7
(63°27'N, 138°50'W
& 63°24'N, 139°07'W)

Reference: Sinclair et al (1975, p. 173).

This company, formerly Leisure Gold Limited, put in the access tote road from Eureka Creek to Black Hills Creek and on to Henderson Creek in 1974. They moved in to Henderson Creek late in the 1975 season, doing a small amount of sluicing (3,900 cubic yards) at the mouth of Golden Gate Creek and digging a bedrock drain. Muck is present to a depth of about 6 feet. The gravels, 6 to 8 feet thick, are all sluiced, as well as 1 to 3 feet of the biotite schist bedrock.

A dredge operated on Henderson Creek from 1949 to 1956, mining to about four miles below the present workings.

The main operations of Territorial Gold Placers during 1975 were on Black Hills Creek. There they dug a bedrock drain and sluiced 55,000 cubic yards of gravel. The section consists of six feet of muck, which is stripped, and 5 to 10 feet of gravel, which is sluiced along with about 2 feet of the underlying schist bedrock. Two D-8 bulldozers were used for stripping and feeding gravels to the sluice-box. A dragline was used to stack tailings.

The early mining on Black Hills Creek consisted of hand mining, including some work on the bench behind the present camp. The Whitehorse-Dawson City winter stage route was along Black Hills Creek. A roadhouse operator, Mr. March, apparently did some placer mining on the creek. Later, Yukon Consolidated Gold Corporation drilled part of the valley.

MAYO-MCQUESTEN AREA

(1) Bardusan Placers Limited — 105 M 14
Thunder Gulch — (63°55'N, 135°15'W)

Reference: Sinclair et al (1975, p. 181).

H. Barchan owns 18 claims on Thunder Gulch up from Lightning Creek and a 3-mile lease on Lightning Creek from just above Keno City to McNeil Creek. 1975 mining operations were 1/2 mile up from the mouth of Thunder Gulch. The mining situation is tight since the creek is steep in gradient and narrow in section. There is very little gravel, much of the 30 feet of unconsolidated material is slide rock of platy to blocky fracturing quartzite and greenstone over bedrock of the same lithology. Working with a D-6 bulldozer and a three cubic yard front end loader, this operator puts in cuts 30 feet wide across the creek. He ground sluices the top 10 feet of slide rock, stacking the largest boulders by bulldozer. This slide rock contains appreciable fine gold which is successively concentrated during the ground sluicing. The bedrock paystreak, with the gold commonly trapped in fractures, averages $45.00 per cubic yard at current prices ($135/oz).

During 1975 he sluiced roughly 15,000 cubic yards. Sluicing a small cut 30 feet above the creek containing very little stream gravel produced 80 ounces of rough gold. Silver-bearing galena is abundant in the concentrate.

(2) E. Bleiler — 115 P 16
Highet Creek — (63°44'N, 136°08'W)

Reference: Sinclair et al (1975, p. 181).

E. Bleiler, who formerly did almost all mining using a four-inch monitor with an 80-foot gravity head through a 12-inch pipe, during 1975 used a D-8 bulldozer to strip the top 10 feet of a gravel section 27 to 30 feet deep. The remaining 17 feet of pay gravel is pushed to the head of the sluice by bulldozer then washed and forced into the sluice by monitor. Mr. Bleiler put in two cuts during the season, one of 10,000 cubic yards, measuring 140 by 70 feet; the second of 8,500 cubic yards, 120 by 70 feet.

(3) F. Erl — 115 P 9
Highet Creek — (63°45'N, 136°09'W)

Reference: Sinclair et al (1975, p. 181).

F. Erl mined for about one month on upper Highet Creek and prepared equipment for the 1976 season.

(4) F. Taylor and J. Brooks — 105 M 14
Duncan Creek — (63°52'N, 135°27'W)

Frank Taylor holds five claims on Lower Duncan Creek about 1 1/2 miles above the mouth, the ground being held since 1960. He added a 1-mile lease below the claims and J. Brooks holds a 1-mile lease above the claims. Since mining started in July on the second lowest claim, these operators put in three left limit cuts, each 250 feet long by 50 to 60 feet wide. There is very little barren overburden and the 6 to 8 feet of pay gravel, which is over a mica schist bedrock, is moved to the sluice by a 3 1/2 yard Michigan front end loader. A complicating aspect of the mining operation is the presence of boulders up to 6 feet in diameter which must be moved.

(5) Elmer Friesen — 115 P 16
Morrison Creek — (63°48'N, 136°06'W)

E. Friesen holds a 2-mile lease on Morrison Creek. During 1975 he put in a tote road from Rudolf Pup to the property.

(6) W. Gordon — 115 P 16
Rudolf Pup — (63°46'N, 136°12'W)

W. Gordon holds a 1-mile lease on Rudolf Pup, a tributary of Highet Creek. During the 1975 season he sluiced about 1,000 cubic yards near the mouth and dug a test pit 1,500 feet upstream from the mouth. The unconsolidated section consists largely of granitic boulders in clay.

(7) Darron Placers — 106 D 4
Dublin Gulch — (64°02'N, 135°50'W)

Reference: Sinclair et al (1975, p. 180).

During 1975 R. Holway and D. Duensing with a crew of three continued mining their claims on Dublin Gulch. They put in one small cut on the right limit of claim 4 but most operations were on claim 3 where 50,000 bedrock square feet were mined; the area being 100 feet wide and 500 feet long on the left limit of the creek. Eighteen feet of bouldery gravel were sluiced. The mining area is in against a steep bank. Thick, overlying muck and glacial till to 35 feet thick was stripped by bulldozer and monitor from the ground to be mined and later into the bank, providing a safety berm or bench, adjacent to the highwall of the cut. The bedrock of the mined area is irregular, with two sharp drops of approximately 15 feet each over 500 feet in the downstream direction.

Mining equipment consists of one D-7, one 955 Traxcavator, two rubber-tired front end loaders (one 4 yard, one 3 1/2 yard) and one B.E. 3/4 yard shovel. To cope with the coarse boulders, a grizzly, spring mounted on the upper side, is used above the dump box of the sluice.

(8) Clear Creek Gold Mines — 115 P 14
Clear Creek — (63°48'N, 137°16'W)

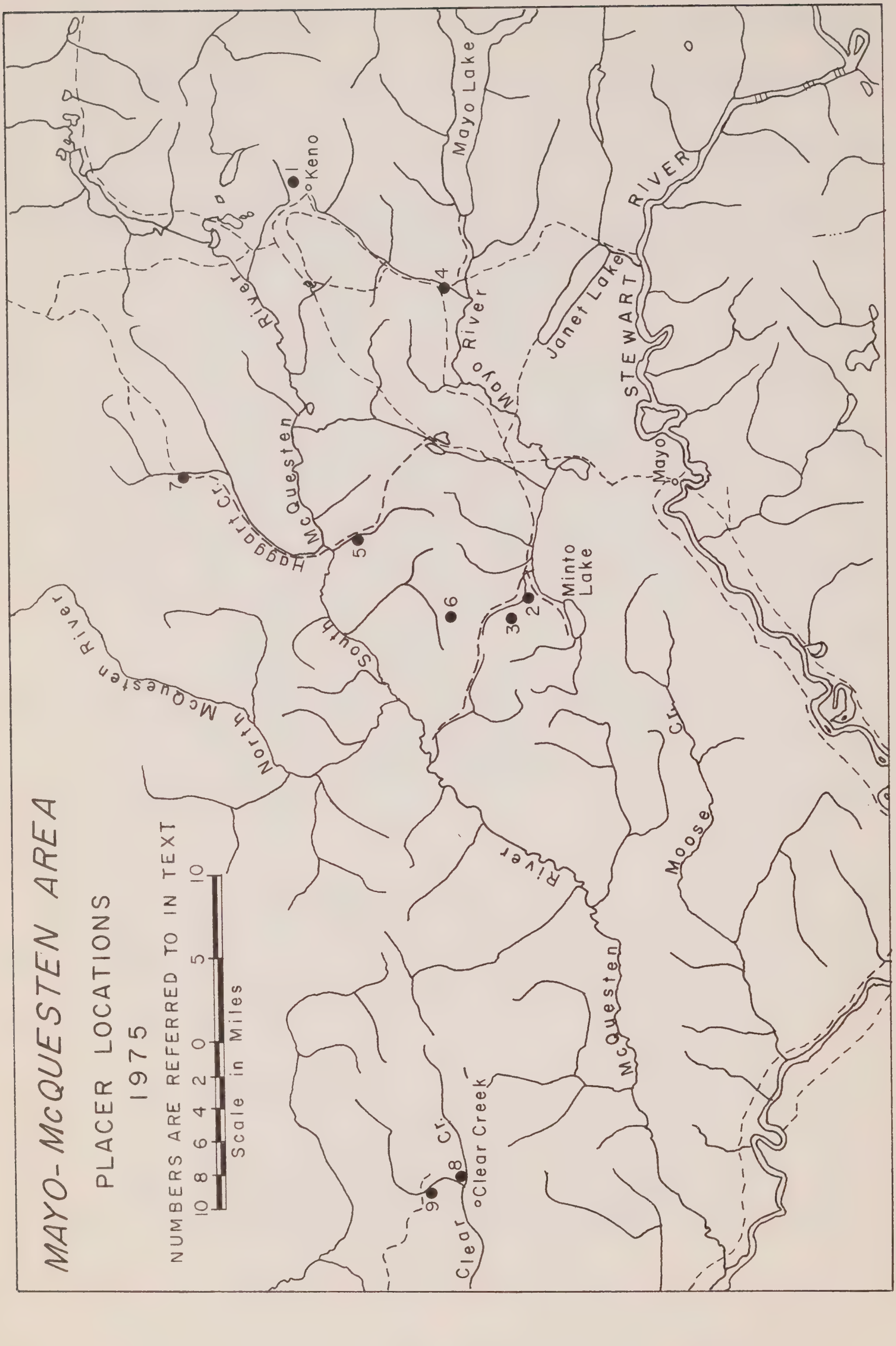
Reference: Sinclair et al (1975, p. 180).

W. Scott and L. Logie continued mining on Left Clear Creek at the mouth of Barney Gulch with a crew of six men, one D-6 and one D-8 bulldozer. They put in one large cut of about 30,000 bedrock square feet on the left limit of the creek at the mouth of the gulch and did preparatory work for the 1976 season up the gulch. The section consists of roughly 15 feet of gravel above a chlorite schist bedrock. Much of the gold produced is coarse, jewellry grade material.

(9) T. Thompson and W. Genier — 115 P 14
Clear Creek — (63°51'N, 137°10'W)

Reference: Sinclair et al (1975, p. 180).

These operators mined on the upper part of Left Clear Creek using one D-6 and one D-8 bulldozer. The gravel section is 10 to 12 feet thick, with about 2 feet of overburden. Much of the gold is coarse, attractive, jewellry grade material.


MAYO-McQUESTEN AREA
PLACER LOCATIONS
1975
NUMBERS ARE REFERRED TO IN TEXT
10 8 6 4 2 0 5 10
Scale in Miles
Keno
Mayo Lake
Mayo River
Janet Lake
STEWART RIVER
Mayo
McQuesten River
Haggart Cr.
Minto Lake
South
North McQuesten River
River
McQuesten
Moose Cr.
Clear Cr.
Clear Creek
1
2
3
4
5
6
7
8
9

LIVINGSTONE CREEK AREA

(1) G. Asuchak, R. Asuchak, J. Nakamura — 105 E 8
Moose Creek — (61°17'N, 134°20'W)

During 1975 these operators worked on Claims #1 - #3 above the mouth of Moose Creek, a left limit tributary of the South Big Salmon River. Work consisted of some 5,000 cubic yards of stripping in preparation for the 1976 season, and the construction of an airstrip 2,000 feet long on the gravel bench of the Big Salmon River at Moose Creek.

(2) Constellation Mines — 105 E 8
Livingstone Creek — (61°22'N, 134°20'W)

M. Furstner, R. Miller and G. McCully operated on Livingstone Creek, a right limit tributary of the South Big Salmon River, using one C-6 Terex and one D-7 bulldozer. They put in a ditch 1,300 feet long to bring water to a monitor for sluicing. Most of their work was preparatory for future mining.

KLUANE AREA

(1) Burwash Mining Company Limited — 115 G 6
Burwash Creek — (61°23'N, 139°19'W)

Reference: Sinclair et al (1975, p. 184).

This company, owned and operated by H. Besner, holds claims on Burwash and Tetamagouche creeks. Mining operations, which were in the canyon of Tetamagouche Creek for the past two years, were moved back to Burwash Creek ground where a centre cut 400 feet long by 200 feet wide and 15 feet deep was put in near the downstream end of the claims.

(2) W. Jones — 115 G 6
Burwash Creek — (61°22'N, 139°17'W)

Working on claims held by Burwash Mining Company Limited, Jones mined a bench on Burwash Creek below Tetamagouche Creek, then stripped ground on the right limit of Burwash Creek immediately above the mouth of Tetamagouche.

(3) R. Muller — 115 G 6
Burwash Creek — (61°23'N, 139°18'W)

Muller has worked on ground owned by Burwash Mining Company (H. Besner) since 1973. During 1975 he put in a cut on a right limit bench 300 feet long by 50 feet wide and 10 feet deep. The bench is about 10 feet above the main channel which had been mined previously.

(4) Greenland Exlorations Limited — 115 G 6
Burwash Creek — (61°22'N, 139°21'W)

Reference: Sinclair et al (1975, p. 184).

Working with the same washing plant-bulldozer-shovel system as in 1974, this company mined part of the season, sluicing some 25,000 cubic yards. A narrow gorge in upper Burwash Creek impeded mining, where one section of the creek, 500 feet long, could be mined with a cut of about 30 feet wide.

(5) Cooper Creek Mining Company — 115 G 6
Burwash Creek — (61°22'N, 139°25'W)

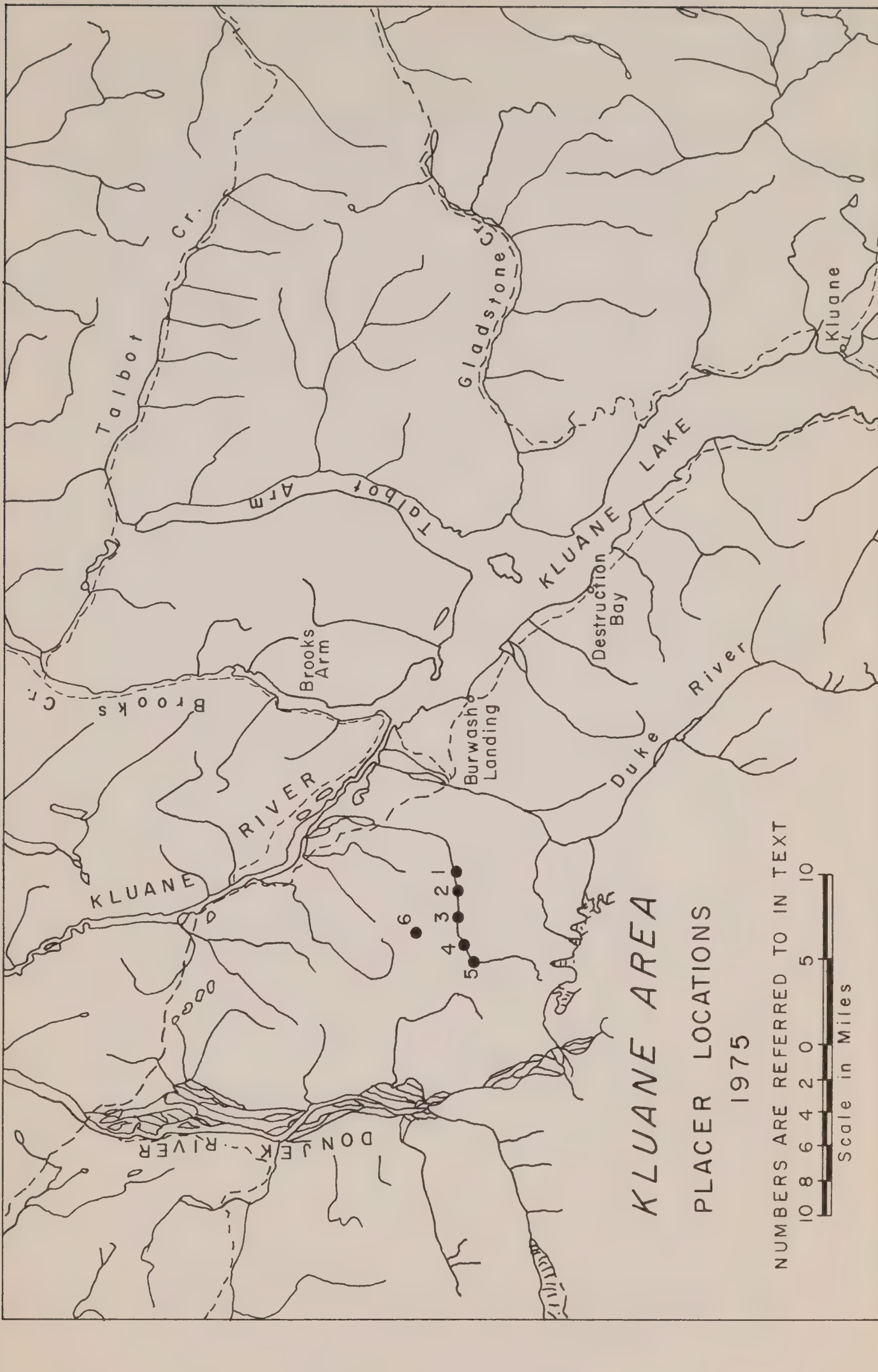
Reference: Sinclair and Gilbert (1975, p. 143).

These operators hold 31 claims on the upper part of Burwash Creek. In 1975 they worked part of the season, stripping the top 6 feet from a cut 400 by 40 feet. The remaining 2 to 3 feet of gravel is fed to a grizzly protected sluice-box by front end loader.

(6) W. Rothbauer — 115 G 6
Tetamagouche Creek — (61°24'N, 139°25'W)

Reference: Sinclair et al (1975, p. 184).

Mr. Rothbauer, operating with a D-8 bulldozer, completed his third year of mining on upper Tetamagouche Creek. He works a one-mile lease on a royalty agreement with R. Holway and owns a claim below the lease. During the season he put in one full width cut at the downstream end of the property 800 feet long by 60 feet wide, sluicing the lower 4 feet of a section 5 to 8 feet thick. On the upper end he mined a cut 300 feet long by 60 feet wide, sluicing the lower 4 feet of a section 10 feet thick.


KLUANE AREA
PLACER LOCATIONS
1975
NUMBERS ARE REFERRED TO IN TEXT
10 8 6 4 2 0 5 10
Scale in Miles
Talbot Cr.
Gladstone Cr.
Talbot Arm
Kluane
KLUANE LAKE
Destruction Bay
Brooks Arm
Brooks Cr.
Burwash Landing
Duke River
KLUANE RIVER
DONJEK RIVER
1
2
3
4
5
6

MOUNT NANSEN AREA

(1) Revenue Creek Placer — 115 I 6
Big Creek — (62°20'N, 137°16'W)

D.C. Wing holds 10 placer claims (MAC 1, DOE 1-9) up from the mouth of a right limit tributary of Big Creek, 4 miles west of Seymour Creek. With a crew of three men he put in a left limit cut 300 feet long by 75 feet wide. The gravel section is 15 feet thick with 2 feet of overburden. Equipment used is a Case 1150 D bulldozer with ripper.

(2) J. Yacklin — 115 I 6
Nansen Creek — (62°06'N, 137°10'W)

Mr. Yacklin holds a one-mile lease on the east fork of Nansen Creek and started mining there in 1974. In 1975 he put in a cut 300 feet long by 60 feet wide about 3/4 of the way up the lease. Using a D-4 tractor with an overshot bucket, in a very simple operation, he mines 8 feet of gravel above a boulder clay.

Claymore Resources Limited* — 115 N 2
Discovery Creek, Moosehorn Range — (63°03'N, 140°56'W)

References: Tempelman-Kluit (1974); Morin (1975).

Claims: The company hold 26 placer leases on the following five creeks draining the Moosehorn Range in the Ladue River area: Discovery Creek, Great Bear Creek, West Swamp Creek, Scottie Creek and Claymore Creek.

Location and Access:

The property is situated about 80 miles south of Dawson and 40 miles north of Beaver Creek, adjacent to the Alaska-Canada border. Access to the area was provided by both tracked vehicles and by helicopter. Land access was by means of a 40 mile tote road from Scottie Creek, Alaska.

History:

The placer leases were staked in 1975 following the discovery by M. Kenyon of Claymore Resources that the upper reaches of Discovery Creek contained abundant coarse gold up to about 2mm.

Description:

The Moosehorn Range is a north-northwest trending ridge up to 4,439 feet in elevation. It is drained by several creeks on all sides, most of which have coarse gravels associated with them. The Range itself is made up of granitic rocks with several known auriferous quartz veins. Some creeks draining this area have concentrated the gold in alluvial placers. In addition, in situ residual weathering of the granitic rocks has resulted in the formation of potential eluvial concentrations of gold.

Drilling along the banks of Discovery Creek has demonstrated the following section: a clay rich gravel with 30 to 60 per cent clay (6 to 10 feet thick); a clean gravel with less than 30 per cent clay (3 to 9 feet thick); a fine sand, which appears to be decomposed bedrock (up to 30 feet thick) and granodiorite bedrock.

Current Work and Results:

In 1975, the property was bulk sampled in the summer from pits along Discovery Creek and the creek was systematically tested by panning. According to the Northern Miner, (September 4, 1975) the five pits or trenches extend for a length of 150 feet and show the gold bearing gravels to have a thickness of about eight feet. Values in the pits ranged from one to seven ounces of raw gold per yard, with an overall average of 1.95 troy ounces.

During November and December rotary drilling was done on Discovery Creek. The drill was a Heli-Drill 500 and was mounted on a Foremost 8T vehicle and the compressor was a Schramm 425/250 mounted on a Nodwell RN-110. Thirty-two holes were drilled to an average depth of 25 feet and several to 50 feet without reaching bedrock. Most of the holes were drilled along the upper 5,000 feet of the creek at 200 foot intervals with a few profiles perpendicular to the creek.

An air flush mechanism was used to return samples. However, abundant ground water seriously hampered complete sample recovery and most of the samples assayed relatively low in gold compared to the bulk sampled pits, for example, a hole 32 feet south of Pit 2 returned 0.163 ounces of gold per cubic yard over 3 feet compared to just under 2 ounces of gold per cubic yard from the pit. The gold values obtained by the drilling program indicate a wider distribution along Discovery Creek than the limited area tested in the summer program.

In addition to work on Discovery Creek, limited pan sampling surveys were made of Swamp Creek, Claymore Creek, and Great Bear Creek, all of which yielded colours in places.

*visited by J. Morin

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Toronto, Ont. M5G 1S5

Barrier Reef Resources Ltd.
904-675 W. Hastings St.
Vancouver, B.C. V6B 1N2

Baroid of Canada Ltd.
600-608 7th St. SW
Calgary, Alta. T2P 1Z2

Beach Gold Mines Ltd.
c/o R.G. Hilker

Bethlehem Copper Corp.
2100-1055 W Hastings St.
Vancouver, B.C. V6E 2H8

Boliden-Preussag Expl. Ltd.
414-850 W Hastings St.
Vancouver, B.C. V6C 1E1

Bow River Resources
333-885 Dunsmuir St.
Vancouver, B.C. V3R 5S9

Brascan Resources Ltd.
502-1155 W Pender St.
Vancouver, B.C. V6E 2P4

British Newfoundland Exploration Ltd.
704-602 W Hastings St.
Vancouver, B.C. V6B 1P2

Canada Tungsten Mining Corp.
1014-111 Richmond St. W.
Toronto, Ont. M5H 2G4

Canadian Natural Resources
330-335 Burrard St.
Vancouver, B.C.

Canadian Superior Expl. Ltd.
2201-1777 W Hastings St.
Vancouver, B.C. V6E 2K3

Canex Placer Ltd.
700-1030 W Georgia St.
Vancouver, B.C. V6E 3A8

Carlos, Allen
13 Asp St.
Whitehorse, Y.T.

Canwex Exploration Ltd.
518-510 W Hastings St.
Vancouver, B.C.

Cassiar Asbestos Corp. Ltd.
85 Richmond St. W.
Toronto, Ont. M5H 2G1

Claymore Resources Ltd.
1502-11111 87th Ave.
Edmonton, Alta. T6G 0X9

Cominco Ltd.
Exploration Dept.
200 Granville Square
Vancouver, B.C. V6C 2R2

Cote, C. & Asuchak, G.
Whitehorse, Y.T.

Cypress Resources Ltd.
705-900 W Hastings St.
Vancouver, B.C. V6C 1B2

Cyprus Anvil Mining Corp. Ltd.
330-355 Burrard St.
Vancouver, B.C. V6C 2G8

Dawson Range Mines Ltd.
Box 466
Lilloolet, B.C.

D.C. Syndicate
1720-1055 W Hastings St.
Vancouver, B.C. V6E 2E9

Delphi Resources
2203-1160 Haro St.
Vancouver, B.C.

El Paso Mining and Milling Co.
500-885 Dunsmuir St.
Vancouver, B.C. V6C 1N5

Envoy Resources Ltd.
333-885 Dunsmuir St.
Vancouver, B.C. V3R 5S9

Essex Mineral Co.
1208-7 King St. E.
Toronto, Ont. M5C 1A8

Getty Mining Pacific
622-510 W Hastings St.
Vancouver, B.C. V6B 1L8

Granby Mining Corp.
17th Floor - 1050 W Pender St.
Vancouver, B.C. V6E 2H7

Great Bear Mining Ltd.
907-675 W Hastings St.
Vancouver, B.C. V6B 1N2

Harman Syndicate
821-602 W Hastings St.
Vancouver, B.C.

Hercon Resources Ltd.
475 Howe St.
Vancouver, B.C. V6C 2B3

Hibberd, R.J.
507-540 Burrard St.
Vancouver, B.C.

Highhawk Mines Ltd.
333-885 Dunsmuir St.
Vancouver, B.C. V6C 1N5

Hilker, R.G.
P.O. Box 4008
Whithorse, Y.T.

Hudson Bay Expl. & Devel. Co. Ltd
P.O. Box 4007
Whitehorse, Y.T.

Hyland Joint Venture
c/o Archer, Cathro & Assoc.

Kerr Addison Mines Ltd.
405-1112 W Pender St.
Vancouver, B.C. V6E 2S1

Klotassin Joint Venture
c/o Archer, Cathro & Assoc.

Lion Mines Ltd.
821-602 W Hastings St.
Vancouver, B.C.

Lobell Mines Ltd.
1230-10th Ave. SW
Calgary, Alta. T3C 0J2

Loon Lake Syndicate
c/o 7052 Sierra Drive
Burnaby, B.C. V5A 1A5

MacMillan Joint Venture
c/o Conwest Exploration Co. Ltd.
10th Floor - 85 Richmond St. W
Toronto, Ont. M5H 2G1

McIntyre Mines Ltd.
1003-409 Granville St.
Vancouver, B.C. V6C 1T2

McLeod, G.
Whitehorse, Y.T.

Monore Metals Corp.
#2-425 Howe St.
Vancouver, B.C.

Mount Nansen Mines Ltd.
420-475 Howe St.
Vancouver, B.C. V6C 2B3

Nithex Expl. & Devel. Ltd.
3000-1055 W Georgia St.
Vancouver, B.C.

Noranda Exploration Co. Ltd.
202-4133 Fourth Ave.
Whitehorse, Y.T. Y1A 1H8

Norcen Energy Resources Ltd.
736-8th Ave. SW
Calgary, Alta. T2P 1H4

Norex Development Ltd.
Whitehorse, Y.T.

Ogilvie Joint Venture
1860 Granville Square
Vancouver, B.C. V6C 1S4

Rayrock Mines Ltd.
1011-2200 Yonge St.
Toronto, Ont. M4S 2C6

Rio Plata Silver Mines Ltd.
420-475 Howe St.
Vancouver, B.C. V6C 2B3

Rio Tinto Canadian Exploration Ltd.
615-Two Bentall Center
555 Burrard St.
Vancouver, B.C. V7X 1M8

Silver City Mines Ltd.
1650-777 Hornby St.
Vancouver, B.C.

Silver Standard Mines Ltd.
904-1199 W Hastings St.
Vancouver, B.C. V6E 3T5

Sovereign Metals Corp.
5th Floor-134 Abbott St.
Vancouver, B.C. V6B 2K4

Spectroair Explorations Ltd.
518-510 W Hastings St.
Vancouver, B.C. V6B 1L8

Swim Lake Mines Ltd.
307-One Howe St.
Vancouver, B.C. V6C 2B3

Tay River Mines Ltd.
2002-1177 W Hastings St.
Vancouver, B.C.

Teck Corp. Ltd.
1199 W Hastings St.
Vancouver, B.C. V6E 2K5

Texasgulf Inc.
701-1281 W Georgia St.
Vancouver, B.C. V6E 3J7

Tintina Silver Mines Ltd.
200-931 Yonge St.
Toronto, Ont. M4W 2H7

Union Carbide Canada Mining Ltd.
601-1112 W Pender St.
Vancouver, B.C. V6E 2S1

Union Miniere Expl. & Mining Co. Ltd.
200-4299 Canada Way
Burnaby, B.C. V5G 1H4

United Keno Hill Mines Ltd.
Exploration Dept.
405 Main St.
Whitehorse, Y.T.

Utah Mines Ltd.
1600-1050 W Pender St.
Vancouver, B.C. V6E 3S7

Welcome North Mines Ltd.
1027-470 Granville St.
Vancouver, B.C. V6C 1V5

Wernecke Joint Venture
c/o Archer, Cathro & Assoc.

Whitehorse Copper Mines Ltd.
P.O. Box 4280
Whitehorse, Y.T. Y1A 3T3

Yukon Revenue Mines Ltd.
117 Industrial Rd.
Whitehorse, Y.T. Y1A 2T8

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Mineral Industry Report 1976 Yukon Territory EGS 1977-1

J. A. Morin
W. D. Sinclair
D. B. Craig
M. Marchand

MINERAL INDUSTRY REPORT

1976

YUKON TERRITORY

BY

J.A. MORIN

W.D. SINCLAIR

D.B. CRAIG

M. MARCHAND

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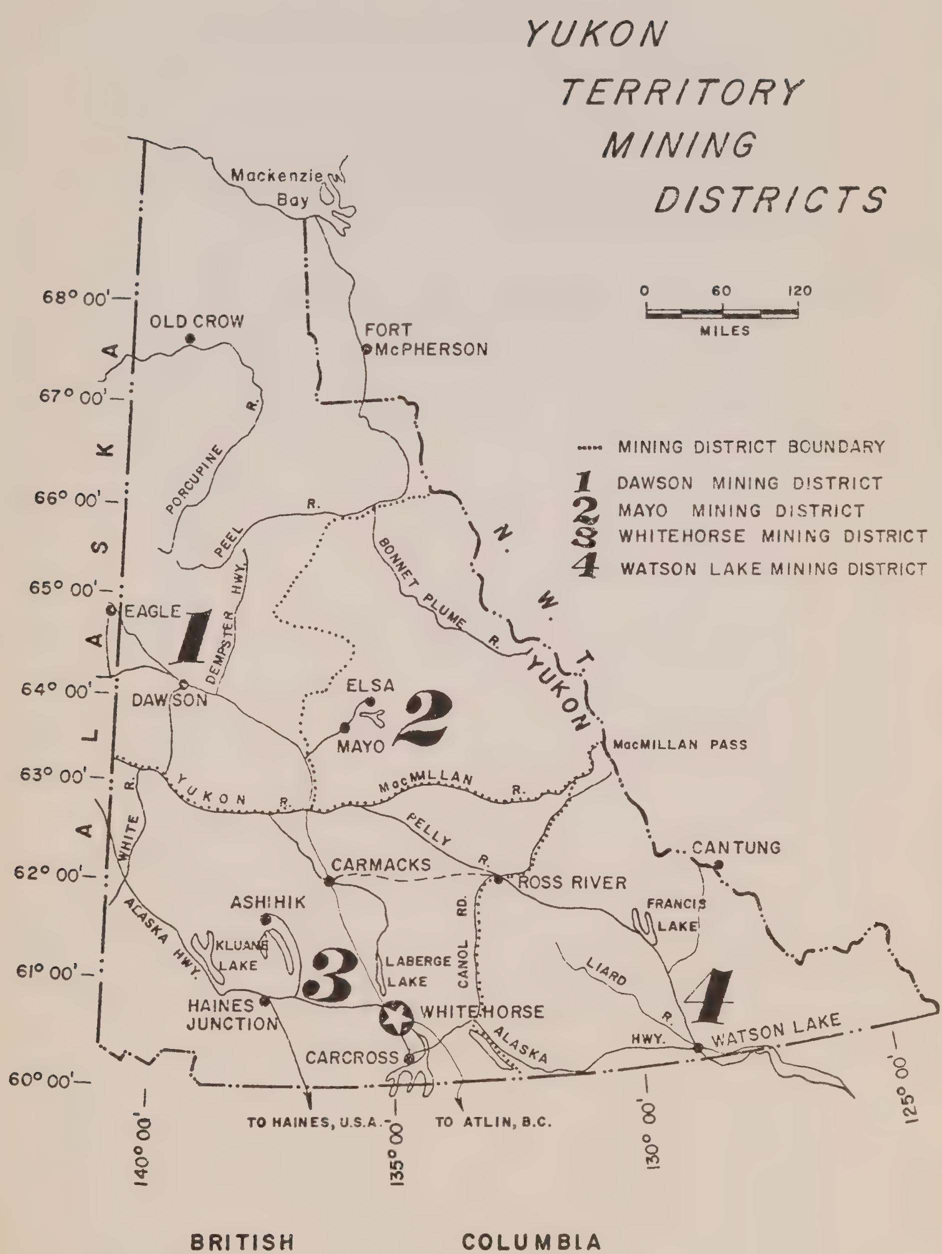
YUKON TERRITORY MINING DISTRICTS
0 60 120
MILES
MINING DISTRICT BOUNDARY
1 DAWSON MINING DISTRICT
2 MAYO MINING DISTRICT
3 WHITEHORSE MINING DISTRICT
4 WATSON LAKE MINING DISTRICT
Mackenzie Bay
OLD CROW
FORT McPHERSON
PORCUPINE R.
PEEL R.
BONNET PLUME R.
DEMPSTER HWY.
EAGLE
DAWSON
ELSA
MAYO
YUKON
N. W. T.
MacMILLAN PASS
YUKON R.
MacMILLAN R.
PELLY R.
WHITE R.
CARMACKS
ROSS RIVER
CANTUNG
FRANCIS LAKE
ASHIHIK
KLUANE LAKE
LABERGE LAKE
CANOL RD.
LIARD R.
ALASKA HWY.
HAINES JUNCTION
WHITEHORSE
CARCROSS
WATSON LAKE
TO HAINES, U.S.A.
TO ATLIN, B.C.
A L A S K A
68° 00'
67° 00'
66° 00'
65° 00'
64° 00'
63° 00'
62° 00'
61° 00'
60° 00'
140° 00'
135° 00'
130° 00'
125° 00'
BRITISH COLUMBIA

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INTRODUCTION

This report is a review of the Yukon mineral industry for 1976 by officers of the Geology section, Northern Natural Resources and Environment Branch, Department of Indian and Northern Affairs. It includes descriptions of work conducted on mineral claims by individuals and mineral exploration companies and operating summaries of the several producing mines in the Yukon. Earlier records of mineral industry activities are presented in the Annual and Summary Reports of the Geological Survey of Canada (1898 to 1933), Memoirs of the Geological Survey of Canada (1934 to 1940), Papers of the Geological Survey of Canada (1960 to 1968) and Mineral Industry Reports of the Department of Indian and Northern Affairs (1969 to 1975).

Information in this report was obtained from visits to mineral properties, from personal communication with individuals and from technical reports, trade journals, newspapers, publications of the Geological Survey of Canada and the monthly reports of the District Mining Recorders. Considerable information was provided by exploration companies in completing and returning the questionnaires on each of the properties on which work was conducted. The cooperation of industry in this regard is gratefully acknowledged. A great deal of valuable information is contained in the geological, geochemical and geophysical reports accepted for credit as assessment work by the Department of Indian and Northern Affairs. A list of assessment reports, both confidential and those available for inspection, are included in the list of Technical Reports prepared by the Canada Center for Geoscience Data for the Department. These reports are listed by NTS locations and are produced annually in February of each year. The assessment reports are currently released for public inspection six months after the claims (on which the work was carried out) have lapsed.

In this report, activities of the mineral industry are divided into lode mining and exploration, coal mining and exploration and placer mining. Each of these sections are further subdivided into the separate mining districts in the Yukon (see the frontispiece). Individual properties in the various mining districts are then listed in order of their occurrence based on the National Topographic System. The location of each property is given by its National Topographic System designation of the 1:50,000 map-sheet in which the property lies and by the latitude and longitude of the centre of the property. In cases where a property involves a large number of claims or covers more than one NTS sheet, several latitudes and longitudes and more than one NTS designation are given. The name or names given to a property are generally the names of the claims that constitute the property. However, if there is a name by which a property was originally or formerly known and which is commonly used at present, then this name takes precedence. Company addresses have been consolidated and placed in a section at the end of this publication.

During the 1976 field season, J.A. Morin visited lode mining and exploration properties in the Mayo and Watson Lake Mining Districts and carried out field investigations in the Macmillan Pass area and in the Moosehorn Range area in the Whitehorse Mining District. In addition, he carried out laboratory investigations of breccia bodies from the Wernecke Mountains and Mississippian volcanic rocks in the Seagull Creek area south of Ross River. W.D. Sinclair visited lode mining and exploration properties in the Whitehorse Mining District and carried out field work in the Mount Freegold area. He left this department in June 1977 to join the staff of the Geological Survey of Canada, Ottawa. M. Marchand visited properties in the Anvil area of the Whitehorse Mining District and started a project on rock geochemistry of the Anvil orebody in conjunction with Cyprus Anvil Mining Corporation. In addit-

ion, he organized and co-ordinated the production of this volume. D.B. Craig visited placer mining properties in the Yukon Territory and lode mining and exploration properties in the Dawson Mining District. In addition to the above, R.C. Carne carried out detailed investigations of lead-zinc-barite properties in the eastern Selwyn Basin. The results of this work are embodied in DIAND Open File EGS 1976-16. S.W. Campbell summarized her field and laboratory investigations of the nickel-copper sulphide deposits in the Kluane Ranges within DIAND Open File EGS 1976-10.

Facilities of the Geological Section

The Geology Office sells topographical, geological, aeronautical, and land-use maps, as well as Geological Survey of Canada publications, covering the Yukon and some adjacent parts of B.C. and the N.W.T. A library of G.S.C., B.C. Dept. of Mines, Alaska Bureau of Mines, U.S.G.S. Alaska publications, and other geological books and journals is available for consultation. Some open file reports on the Yukon are also available for viewing. A sizeable collection (25,000) of air photos covering the Yukon from Latitude 60° to 65° is available for use in the office as is the latest catalogue of Yukon Air Photos from the National Air Photo Library. An updated computer list of 'good' quality photos of the 1972-1976 satellite [LANDSAT] imagery of the Yukon is included in the Air Photo catalogue. We also have a LANDSAT mosaic of the cordillera on display and a nearly complete collection of colour LANDSAT photos of the Yukon

The H.S. Bostock Core Library, situated across the street from the Geology Office, contains drill core from various Yukon mining properties, some available for inspection and the remainder confidential. The core library also contains working quarters equipped with diamond saws, a core splitter, a vibrating polisher, rock staining facilities and fume hood. A petrographic microscope, with capabilities for both transmitted and reflected light, and a binocular microscope are also situated in the core library. The Geology Office recently acquired the McPhar Spectra 44, a four channel gamma-ray spectrometer and a new UV light. The equipment and instruments are available for use by industry personnel on arrangement with one of the geologists.

The office is staffed by four geologists who welcome visits by exploration personnel when they are in town. The office is situated at 200 Range Rd. in the Takhini sub-division, about halfway between downtown Whitehorse and the airport, at the top of "Two Mile Hill". The staff and their telephone extensions are listed below:

Doug Craig, Regional Geologist 136; Jim Morin, District Geologist 138;
Michael Marchand, Staff Geologist 136; Beth Phillips, Clerk & Map Sales 140.

Telephone - 403-668-5151 Telex - 036-8-342
Mailing Address:

Geology Section
Dept. of I.A.N.D.
200 Range Road
Whitehorse, Yukon
Y1A 3V1

MINERAL PRODUCTION OF YUKON

The value of mineral production in the Yukon fell from $228,840,396 in 1975 to $130,469,000 in 1976, a decrease of 43.0%. Copper and cadmium production were up while all others were down. Only the value of copper and asbestos production went up.

The cause of this was due primarily to lengthy strikes at Cyprus Anvil, United Keno Hill Mines and Whitehorse Copper Mines.

TABLE I

Mineral Production, Yukon Territory

	1975	1976
Gold $	5,255,077	3,910,000
grams	997 986	965 000
ounces	32,086	31,000
Silver $	28,531,397	13,446,000
grams	196 943 109	97 634 000
ounces	6,331,868	3,139,000
Lead $	54,888,680	19,104,000
kg	122 863 634	38 254 000
lb	270,867,945	84,335,000
Zinc $	95,400,540	42,898,000
kg	115 394 553	51 723 000
lb	254,401,441	114,029,000
Cadmium $	15,423	12,000
kg	2 050	3 000
lb	4,519	5,000
Copper $	11,928,559	16,639,000
kg	8 487 245	11 039 000
lb	18,711,172	24,336,000
Asbestos $	32,820,720	34,460,000
tonnes	103 725	103 000
short tons	114,348	113,000
Coal		
short tons	25,712	29,974

Mineral Exploration Highlights, Yukon Territory, 1976

The number of quartz claims staked in 1976 in Yukon increased by 20.9% to 10,357 while the claims in good standing declined to 32,985. Exploration expenditures were estimated at $16.5 million, a slight decrease over the $18.5 million spent in 1975.

TABLE II

Mineral Claims Staked, Yukon Territory

Mining District	1973	1974	1975	1976
Dawson	1,168	1,504	1,695	1,555
Mayo	2,587	6,038	1,609	4,390
Watson Lake	2,509	1,325	1,801	2,478
Whitehorse	3,119	4,867	3,454	1,934
Totals	9,383	13,734	8,559	10,357

The most exciting of recent developments is the discovery of copper-uranium mineralization in the Quartet Lakes-Bond Creek area by Archer, Cathro and Associates. The uranium mineralization occurs mainly in breccia bodies and adjacent country rocks of Lower Proterozoic age. Some diamond drilling was carried out on several occurrences in 1976, but the potential for commercial deposits is still relatively unknown.

Another interesting development is the recognition of volcanogenic massive sulphides in the Seagull Creek area, Pelly Mountains. On the MM property owned by Cyprus Anvil, diamond drilling carried out over the past few years has intersected massive sulphide lenses containing lead, zinc and silver. The massive sulphides are stratigraphically overlain by bedded barite and occur within a sequence of intermediate to felsic metavolcanics of Mississippian age. Lead-zinc-silver mineralization also occurs at several other localities in the Seagull Creek area.

Exploration for carbonate-hosted zinc-lead deposits in the Mackenzie Mountains decreased significantly in 1976 relative to the previous two years. The Goz Creek property of Barrier Reef, which stimulated much of the initial activity in the Bonnet Plume River area, was inactive in 1976 although there were a number of diamond drilling programs on other properties in the Mackenzie, Richardson and Ogilvie Mountains.

Much exploration in 1976 was focussed toward shale-hosted lead-zinc and lead-zinc-barite deposits in the Selwyn Basin. Diamond drilling was carried out by Canex Placer on their Howards Pass deposit and indications are that this deposit has the potential to be one of the world's major zinc-lead deposits.

In the MacMillan Pass area, diamond drilling on the JASON claims by Ogilvie Joint Venture has outlined a mineralized zone similar to the neighbouring TOM deposit owned by Hudson Bay Exploration and Development. These deposits consist of stratiform lead-zinc sulphides with appreciable amounts of silver and associated bedded barite of Devono-Mississippian age. Numerous companies and exploration syndicates were active in the MacMillan Pass area in 1976. In addition to the lead-zinc-silver-barite deposits, there are a number of occurrences within the Devono-Mississippian sequence of bedded barite characterized by a virtual absence of sulphides. One of these, the TEA

property, is presently being developed by Yukon Barite Company. This property, about 23 miles southwest of MacMillan Pass, has surface indications of several million tons of drilling mud grade barite, much of which is pure enough that no beneficiation is required. Plans are currently underway to construct a mill in Ross River capable of producing roughly 20,000 tons per year.

The Anvil Range area continued to be active in 1976 with a number of companies carrying out drilling programs. Cyrpus Anvil intersected a significant section of lead-zinc-silver mineralization on their DY claims roughly 12 miles southeast of the main Faro deposit. The mineralization is similar to that found in the GRUM deposit and was encountered at depths of 1,700 to 2,200 feet below surface. Further work is planned in 1977. On the GRUM deposit, the initial stage of surface and underground exploration and development has been completed and feasibility studies are currently underway. Reserves for the GRUM deposit are reported as 28.6 million tons of proven and probable ore, with an additional 10-12 million tons of potential ore indicated by drilling. The higher grade sections of the deposit carry up to 14 per cent combined lead and zinc and 2.6 ounces silver per ton.

In the Dawson Range, the level of exploration activity was relatively low although there were several drilling programs testing for porphyry copper-molybdenum deposits. These deposits are generally associated with Tertiary feldspar porphyry dykes and plugs and consist of disseminated and fracture-controlled sulphides in the altered intrusives and host rocks. Lead-zinc and gold-silver mineralization are often associated with these deposits. Gold-silver mineralization in particular appears to be localized along north-south trending fault zones. Results of a feasibility study carried out on the Minto copper deposit, 12 miles west of Minto, generally do not favour production in the near future. This deposit, which contains 8 1/2 million tons of 1.7 per cent copper, may become economic if the price of copper increases substantially.

Elsewhere in the Yukon, Claymore Resources recovered significant amounts of gold from their placer operation in the Moosehorn Range and are anticipating further work in 1977. Harman Management shipped roughly 100 tons of high grade silver-lead ore from the Plata property in the Hess Mountains. Noranda Exploration carried out further work on the McMillan property northeast of Watson Lake and Union Carbide carried out a reconnaissance exploration program for tungsten in eastern Selwyn Basin.

THE GOZ CREEK ZINC DEPOSIT, YUKON TERRITORY

By
Albert F. Reeve*

INTRODUCTION

In June 1973, abundant dolostone rubble and stream debris mineralized with sphalerite was found in several tributaries of Goz Creek in a remote part of the eastern Yukon near the headwaters of the Bonnet Plume River. Sediment from these streams also contained concentrations of up to 7,700 ppm zinc and 360 ppm lead. These indications were subsequently traced to extensively mineralized outcrops of carbonate strata on east trending ridges about six miles in length (64°30'N, Latitude, 132°30'W Longitude). Twenty closely spaced diamond drill holes were bored in the general vicinity of the most promising outcrops in 1974 to determine the continuity and form of the richest mineralized zones. In 1975 a further thirty-five holes were bored on a wider spaced pattern to provide an estimate of the tonnage potential and overall distribution of the mineralization. The total length of the fifty-five drill holes is 20,448 feet. The Goz Creek prospect, owned by Barrier Reef Resources Limited, became conspicuous because of spectacular high grade outcrops which were easily examined by many geologists who visited the area. Also, the presence of large amounts of silica and smithsonite were considered unusual relative to other known carbonate-hosted zinc and lead deposits in western and northern Canada.

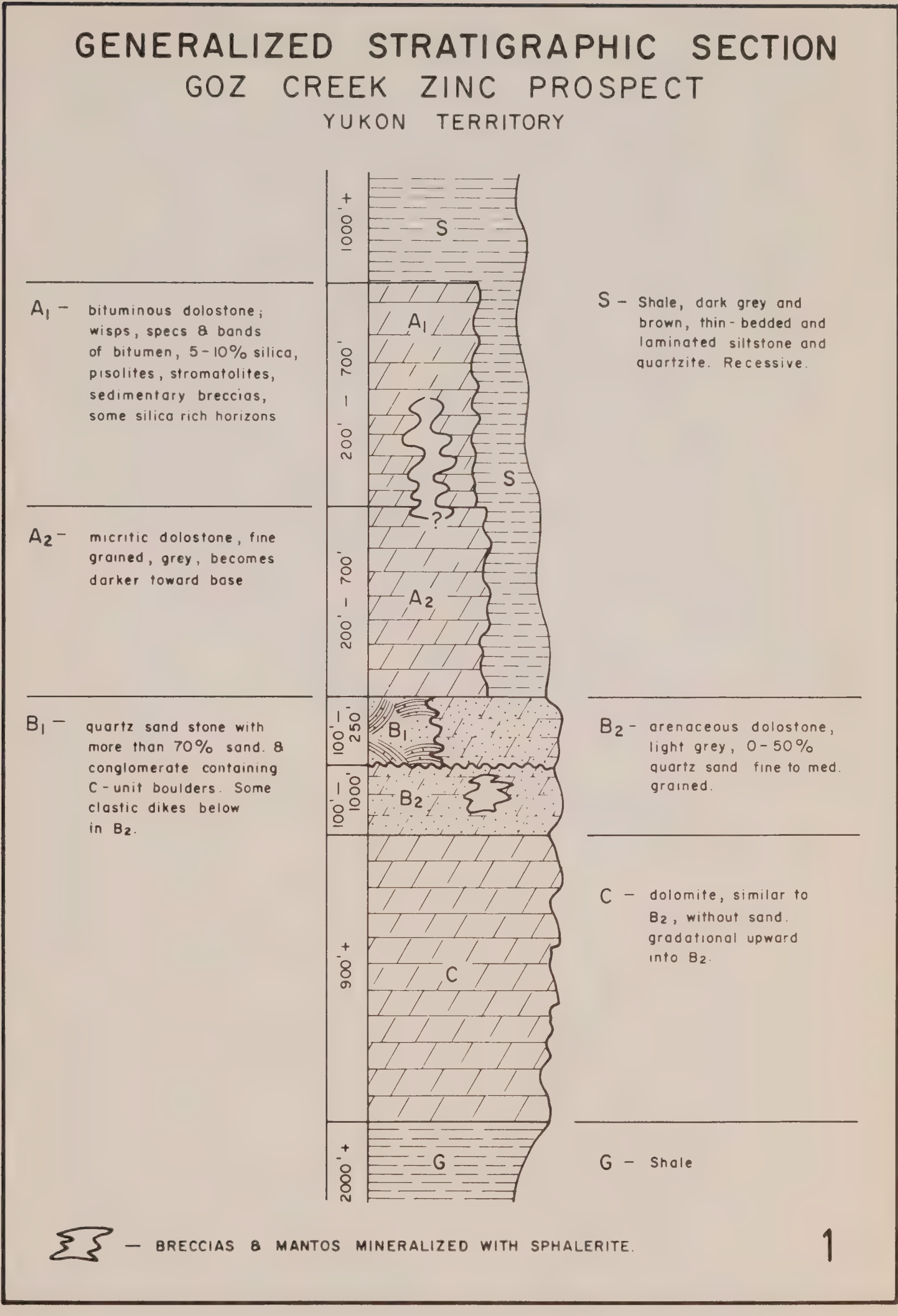
REGIONAL GEOLOGY

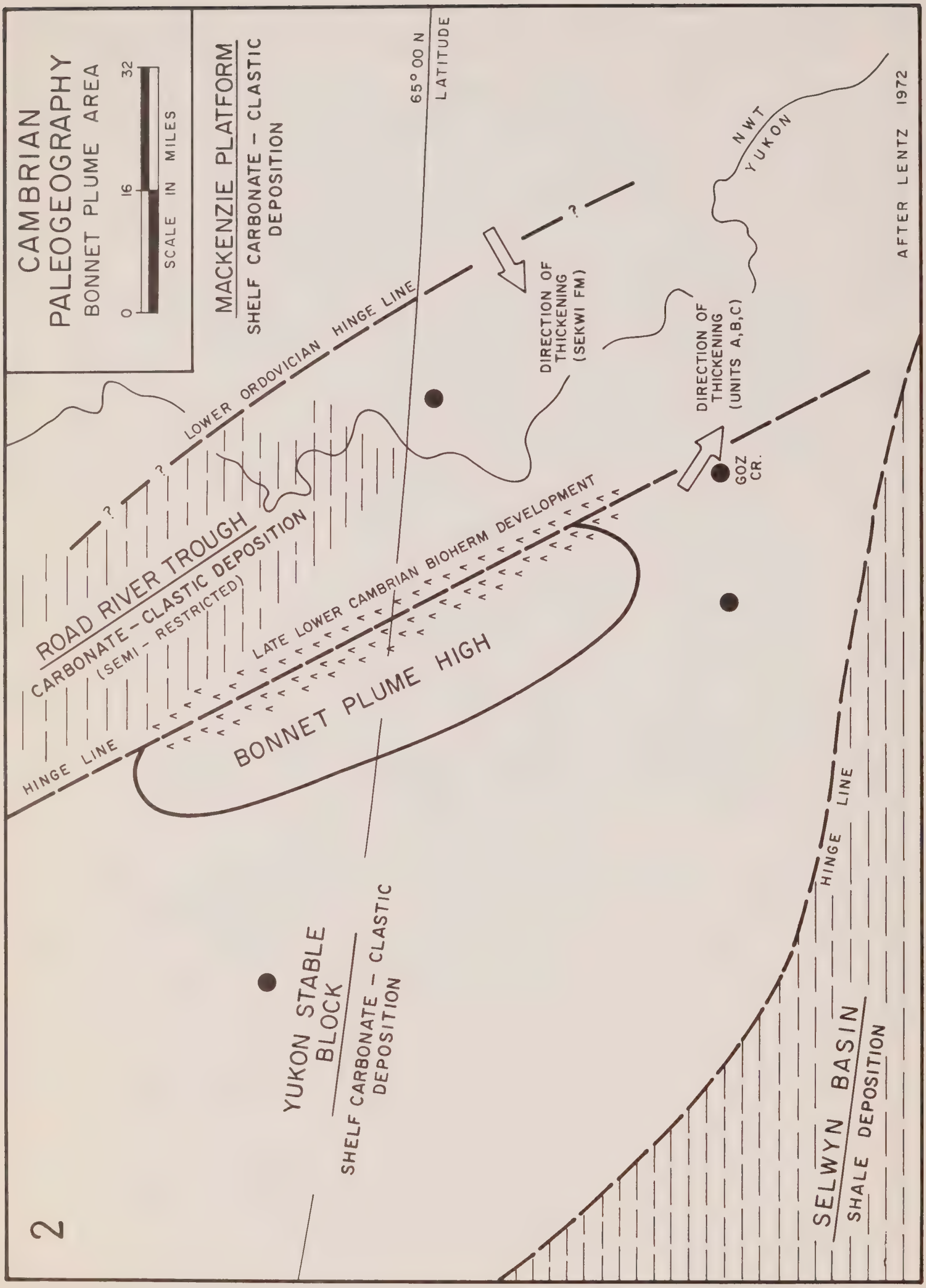
Goz Creek is situated on the southwest flank of the MacKenzie Mountains, which are composed of northwest trending folded and faulted Paleozoic and Proterozoic sedimentary strata. The Geological Survey of Canada published Preliminary Geological Maps of the region in 1953 and 1974 based upon reconnaissance mapping carried out by Wheeler in 1952, and by Blusson in the late 1960's and early 1970's.

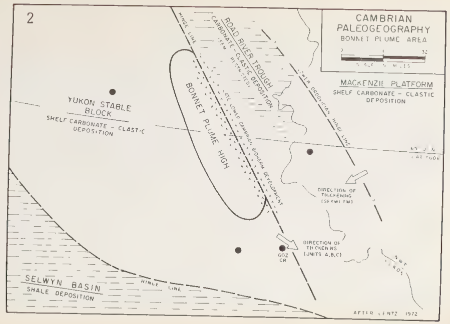
Mature topographic development and typical trellis drainage patterns characterize the area. Local elevations range from about 3,500' to 6,500' ASL and glaciation appears to have been restricted to valleys below the 4,800' elevation in the immediate vicinity of Goz Creek.

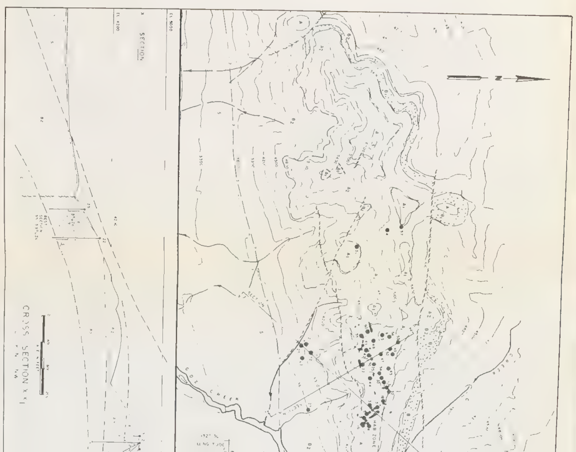
The mineralized carbonate sequence is part of the Lower Cambrian Sekwi or Backbone Formation overlain by a shale unit which is also believed to be of Lower Cambrian age. These rocks occupy a gently arched, triangular shaped structural block of about seventy square miles with its eastward trending south boundary along the valleys of Goz and Duo Creeks. The north and west boundaries of this area are marked by faults and the south by an apparent abrupt facies change from Lower Cambrian shelf carbonates southward into time-equivalent basinal shales. These Cambrian rocks are underlain by Proterozoic sediments which outcrop extensively to the south and southwest and are partially covered by younger Paleozoic sediments to the north.

*Geologist, 904-675 West Hastings Street
Vancouver, B.C.


GENERALIZED STRATIGRAPHIC SECTION
GOZ CREEK ZINC PROSPECT
YUKON TERRITORY
1000'+
S
200' - 700'
A1
?
200' - 700'
A2
100' - 250'
B1
100' - 1000'
B2
900'+
C
2000'+
G
A1 - bituminous dolostone; wisps, specs & bands of bitumen, 5-10% silica, pisolites, stromatolites, sedimentary breccias, some silica rich horizons
A2 - micritic dolostone, fine grained, grey, becomes darker toward base
B1 - quartz sand stone with more than 70% sand. & conglomerate containing C-unit boulders. Some clastic dikes below in B2.
S - Shale, dark grey and brown, thin-bedded and laminated siltstone and quartzite. Recessive.
B2 - arenaceous dolostone, light grey, 0-50% quartz sand fine to med. grained.
C - dolomite, similar to B2, without sand. gradational upward into B2.
G - Shale
— BRECCIAS & MANTOS MINERALIZED WITH SPHALERITE.
1


CAMBRIAN PALEOGEOGRAPHY
BONNET PLUME AREA
0 16 32
SCALE IN MILES
MACKENZIE PLATFORM
SHELF CARBONATE - CLASTIC DEPOSITION
65° 00 N LATITUDE
NWT
YUKON
LOWER ORDOVICIAN HINGE LINE
?
DIRECTION OF THICKENING (SEKWI FM)
DIRECTION OF THICKENING (UNITS A,B,C)
GOZ CR.
AFTER LENTZ 1972
ROAD RIVER TROUGH
CARBONATE - CLASTIC DEPOSITION
(SEMI - RESTRICTED)
LATE LOWER CAMBRIAN BIOHERM DEVELOPMENT
HINGE LINE
BONNET PLUME HIGH
YUKON STABLE BLOCK
SHELF CARBONATE - CLASTIC DEPOSITION
HINGE LINE
SELWYN BASIN
SHALE DEPOSITION
2


2
CAMBRIAN
PALEOGEOGRAPHY
BONNET PLUME AREA
MACKENZIE PLATFORM
SHELF CARBONATE - CLASTIC
DEPOSITION
ROAD RIVER TROUGH
CARBONATE - CLASTIC DEPOSITION
HINGE LINE
YUKON STABLE
BLOCK
SHELF CARBONATE - CLASTIC
DEPOSITION
BONNET PLUME HIGH
DIRECTION OF
THICKENING
DIRECTION OF
THICKENING
(UNITS A,B,C)
GOZ
CR
SELWYN BASIN
SHALE DEPOSITION
HINGE LINE
AFTER LENTZ 1972


SECTION
GOZ CREEK
HAB ZONE
CROSS SECTION X X1

STRATIGRAPHY AND DEVELOPMENT OF THE HOST CARBONATE SEQUENCE

At Goz Creek more than 2,000 feet of carbonate strata were deposited in a shallow water marine environment near the southern extremity of the Bonnet Plume High (Lenz, 1972), an active structural feature which formed part of the shelf between the Sewlyn shale basin and the Road River Trough when they began to develop in Cambrian Time (see Figures 1 and 2).

The Goz Creek carbonates also occur on the southeastward projection of a hinge-line along the southwest edge of the Road River Trough.

The carbonate sequence at Goz Creek (Units A, B and C as shown on the stratigraphic column, Fig. 1) rapidly becomes thinner as it extends northwestward toward the interior of the Bonnet Plume shelf.

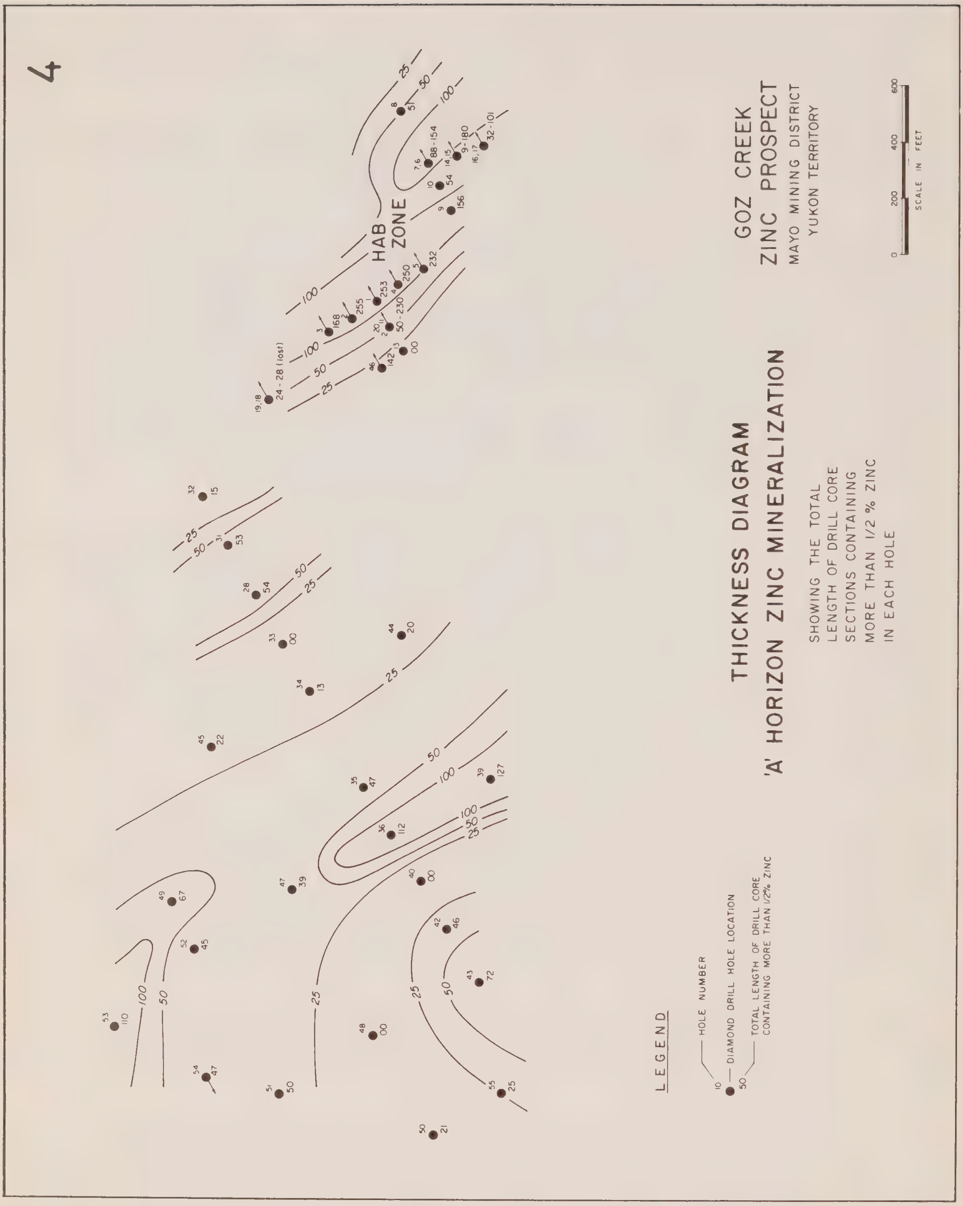
Initial subsidence of the shelf and deposition of the "C" and "B" carbonates was followed by a period of uplift and subaerial exposure marked by the sandy and conglomeratic "B_1" horizon. During this time diagenesis and dolomitization began, followed by the development of low displacement, near vertical faults: an east-trending group parallel to the hinge-line of the Selwyn Basin to the south and a northwest-trending group parallel to the hinge-line along the west side of the Road River Trough. The fractures and breccias which host the zinc mineralization in the "B_2" horizon appear to have formed along the northwest trending hing-line faults by solution, slump and collapse in a paleokarst system beneath the unconformity at the top of the "B" horizon.

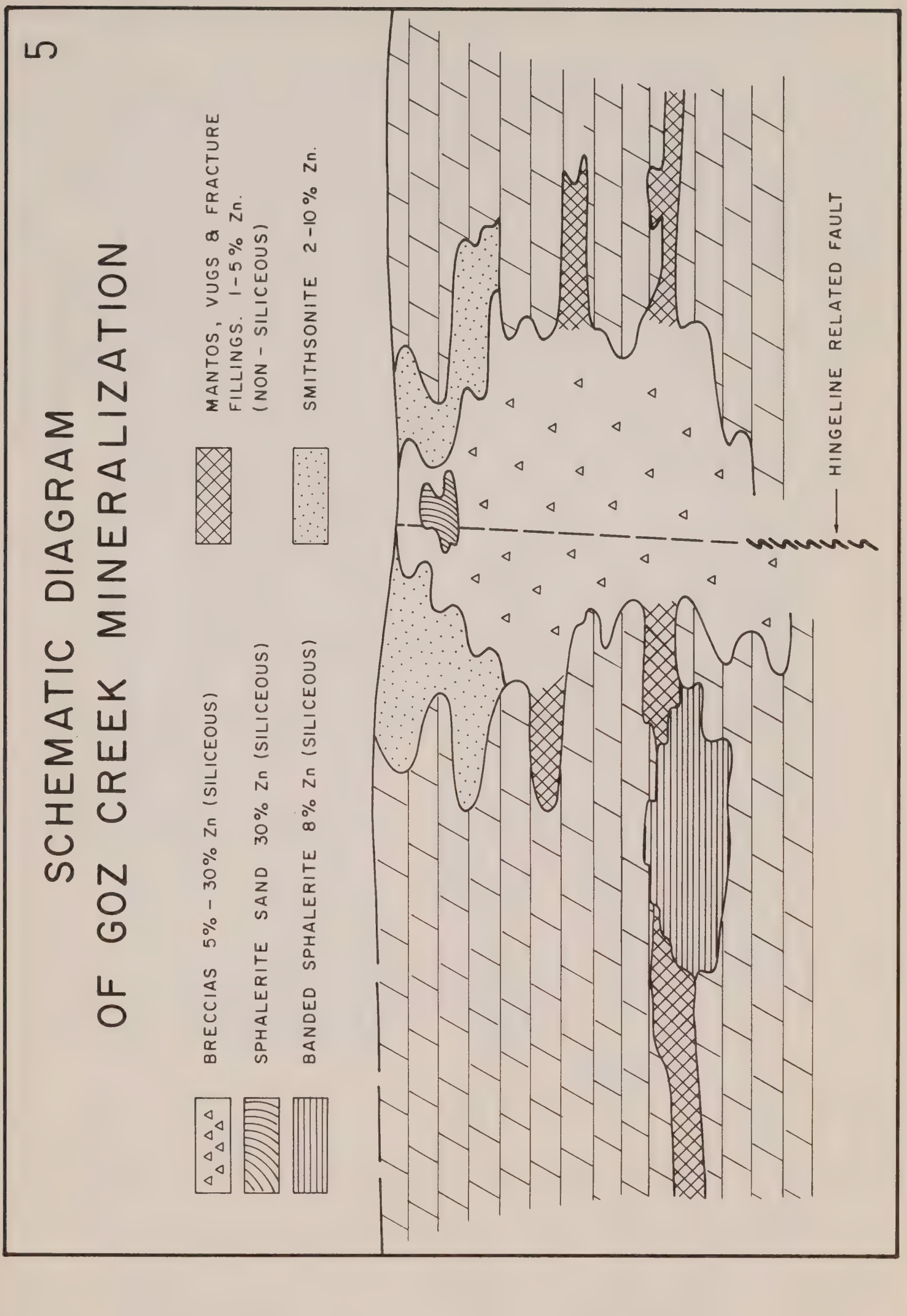
The "A" horizon carbonates were deposited as subsidence of the Bonnet Plume shelf resumed. This unit appears, at Goz Creek, to be a more seaward or frontal shelf facies closer to its basinal shale equivalent than the "B" or "C" units below. The "A" carbonates lack important quantities of sand and contain relic textures which are enhanced by the presence in some areas by wisps, bands, and blebs of pyrobitumen. Stromatolitic structures, slump talus and abundant pisolitic textures are present in the "A" horizon. An interpretation of the relationship between the "S" shale and "A" carbonates is shown on Cross Section XX, (Fig. 3) and assumes an abrupt southward shale out of the carbonate into "S" basinal shales.

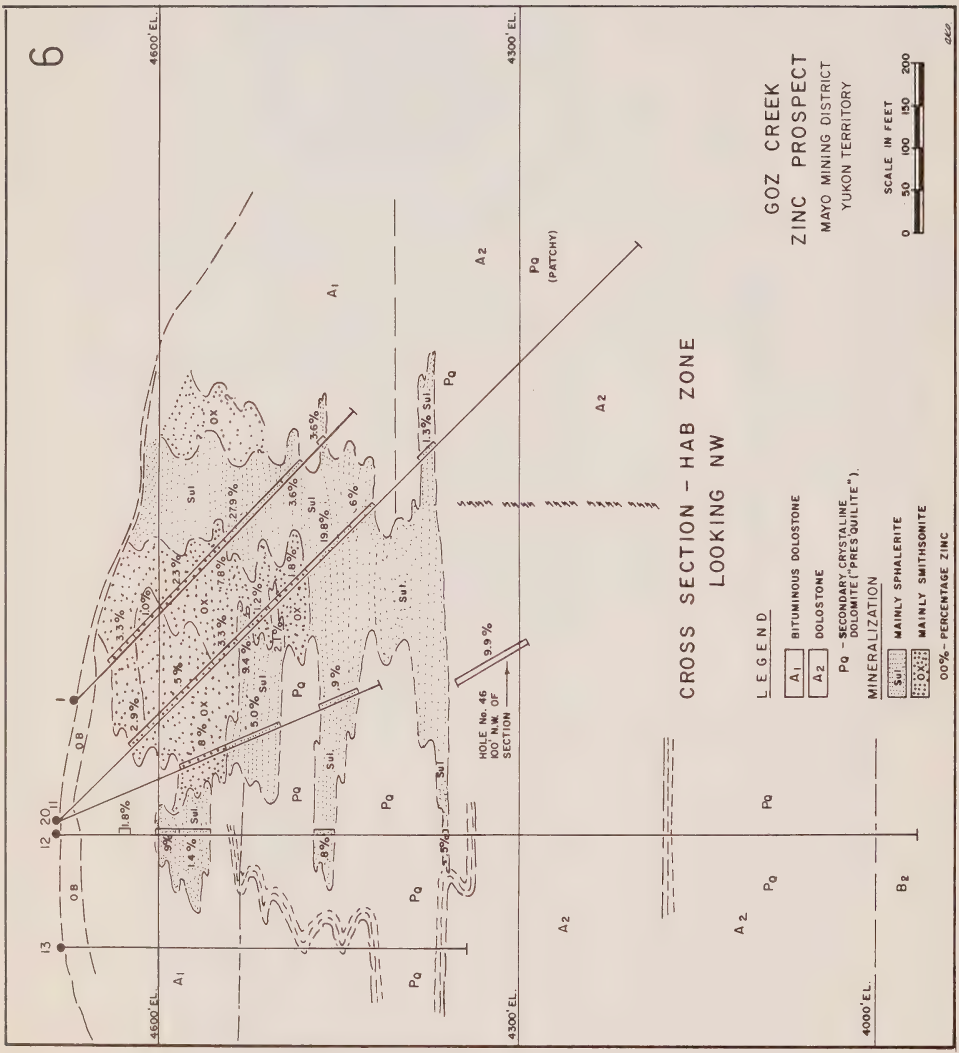
Hinge-line faults were again active after the deposition of the "A" carbonates and acted as loci for the development of breccia systems and secondary fractures which were subsequently mineralized with sphalerite, silica and sparry dolomite. While specific evidence of an unconformity beneath which the "A" horizon breccias may have developed by a paleokarst process is lacking, it seems unlikely that such breccias could have developed in any other way considering the relatively passive structural environment.

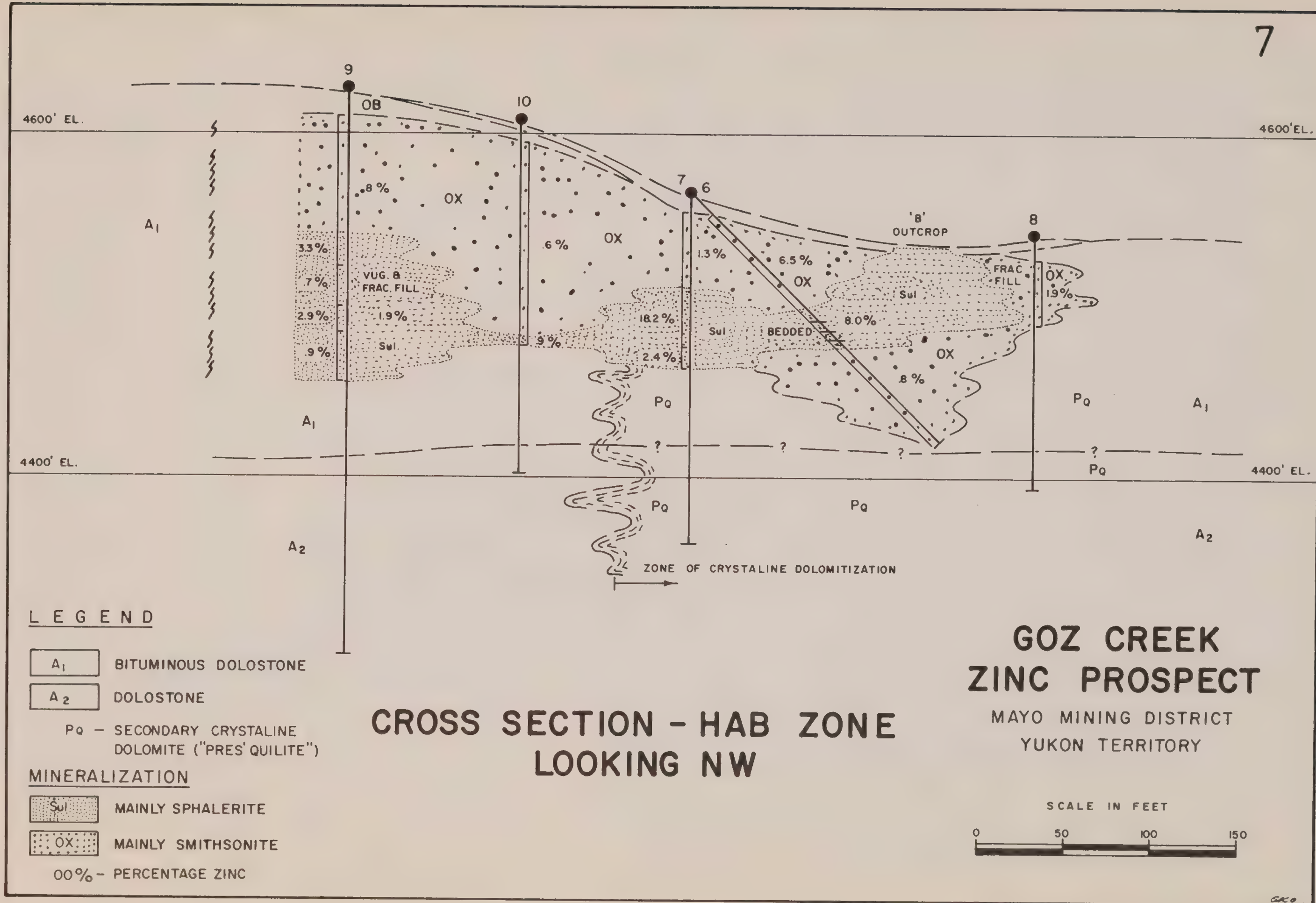
Following carbonate deposition, dolomitization and preparation of openings in the "A_1" bituminous dolostone unit, subsidence of the Bonnet Plume shelf again resumed and the Goz Creek carbonate sequence was buried by basinal shales of the "S" unit.

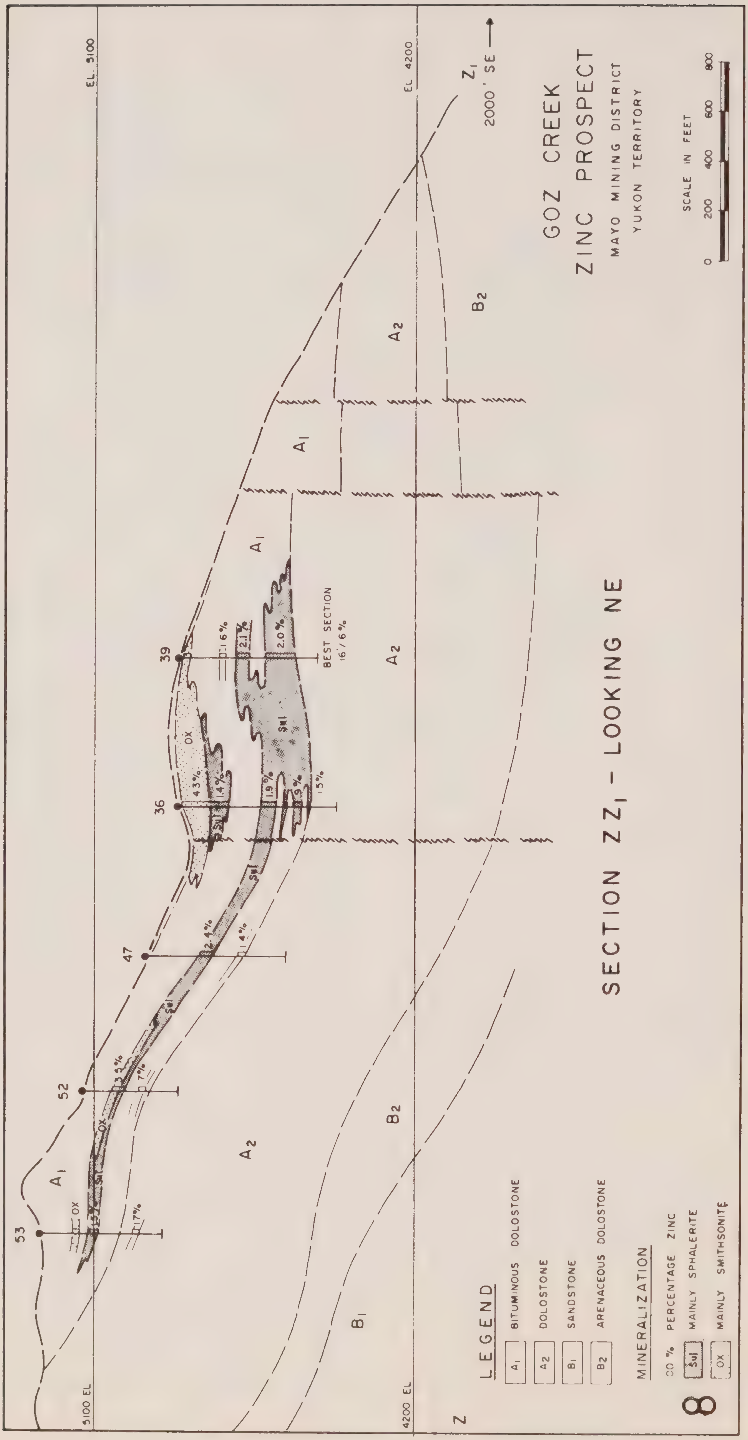
The introduction of sphalerite, silica and sparry dolomite into fractures, vugs and breccias is believed to have occurred in a complex paragenetic process after shallow burial by the "S" shales. The exposure of mineralized outcrops by erosion and gentle arching of the host beds probably occurred during regional Larimide uplift. A lack of glacial activity above the 4,800 foot elevation since that time (Sangster, 1975; Hairsine, et al, 1975) allowed deep chemical weathering, up to 250 feet, of the upper "A_1" carbonates, resulting in large areas of leached, finely porous dolostone and the development of smithsonite on the flanks and tops of zones mineralized with sphalerite.


4
GOZ CREEK
ZINC PROSPECT
MAYO MINING DISTRICT
YUKON TERRITORY
THICKNESS DIAGRAM
'A' HORIZON ZINC MINERALIZATION
SHOWING THE TOTAL
LENGTH OF DRILL CORE
SECTIONS CONTAINING
MORE THAN 1/2 % ZINC
IN EACH HOLE
HAB
ZONE
LEGEND
HOLE NUMBER
DIAMOND DRILL HOLE LOCATION
TOTAL LENGTH OF DRILL CORE
CONTAINING MORE THAN 1/2% ZINC
0 200 400 600
SCALE IN FEET


5
SCHEMATIC DIAGRAM
OF GOZ CREEK MINERALIZATION
BRECCIAS 5% - 30% Zn (SILICEOUS)
SPHALERITE SAND 30% Zn (SILICEOUS)
BANDED SPHALERITE 8% Zn (SILICEOUS)
MANTOS, VUGS & FRACTURE FILLINGS. 1-5% Zn. (NON-SILICEOUS)
SMITHSONITE 2-10% Zn.
HINGELINE RELATED FAULT


6
CROSS SECTION - HAB ZONE
LOOKING NW
GOZ CREEK
ZINC PROSPECT
MAYO MINING DISTRICT
YUKON TERRITORY
SCALE IN FEET
0 50 100 150 200
LEGEND
A1 BITUMINOUS DOLOSTONE
A2 DOLOSTONE
PQ - SECONDARY CRYSTALINE DOLOMITE ("PRES'QUILITE").
MINERALIZATION
Sul MAINLY SPHALERITE
OX MAINLY SMITHSONITE
00% - PERCENTAGE ZINC
HOLE No. 46
100' N.W. OF
SECTION
4600' EL.
4300' EL.
4000' EL.
PQ (PATCHY)
OB
13
12
20
11
1
9.9%
1.3% Sul
3.6%
19.8%
27.9%
23%
10%
3.3%
2.9%
1.8%
1.4%
B2


7
9
10
7
6
8
OB
4600' EL.
4600'EL.
4400' EL.
4400' EL.
A1
A2
Pq
OX
Sul
.8 %
3.3%
.7%
2.9%
.9%
VUG. & FRAC. FILL
1.9%
.6 %
.9%
1.3%
18.2 %
2.4 %
BEDDED
6.5 %
8.0%
.8 %
'B' OUTCROP
FRAC FILL
1.9%
?
ZONE OF CRYSTALINE DOLOMITIZATION
LEGEND
A1 BITUMINOUS DOLOSTONE
A2 DOLOSTONE
Pq – SECONDARY CRYSTALINE DOLOMITE ("PRES'QUILITE")
MINERALIZATION
Sul MAINLY SPHALERITE
OX MAINLY SMITHSONITE
00% – PERCENTAGE ZINC
CROSS SECTION - HAB ZONE
LOOKING NW
GOZ CREEK
ZINC PROSPECT
MAYO MINING DISTRICT
YUKON TERRITORY
SCALE IN FEET
0
50
100
150


SECTION ZZ1 - LOOKING NE
GOZ CREEK
ZINC PROSPECT
MAYO MINING DISTRICT
YUKON TERRITORY
SCALE IN FEET
0 200 400 600 800
LEGEND
A1 BITUMINOUS DOLOSTONE
A2 DOLOSTONE
B1 SANDSTONE
B2 ARENACEOUS DOLOSTONE
MINERALIZATION
00 % PERCENTAGE ZINC
Sul MAINLY SPHALERITE
OX MAINLY SMITHSONITE
5100 EL
4200 EL
EL. 5100
EL 4200
Z
Z1
2000' SE
53
52
47
36
39
BEST SECTION
16'/6%
8

MINERALIZATION

(see Figures 4 and 5)

Breccias

Northwest trending, elongate, siliceous breccia zones are heavily mineralized with red, brown, yellow and light green sphalerite as well as very minor amounts of galena, pyrite and boulangerite. This material carries less than 0.5 ounces per ton silver and about 0.04 per cent cadmium. The sphalerite is iron poor with the red varieties containing variable amounts of manganese, indicated by pulverulent black residues on weathered surfaces. The breccias contain 5 to 30 per cent zinc, and have ragged terminations which extend laterally along apparent horizontal bedding planes as lean mantos or crude sheets.

These zones have a variety of cross-sectional shapes; for example, the HAB breccia zone, which is about 1,600 feet long, where it is cut by drill holes No. 1, 11, 12 and 20 (Fig. 6), has the shape of a truncated Christmas tree with a height of 360 feet and a maximum width of about 300 feet. The downward extent of the breccia on this section has not been determined and there is some possibility that it breaks through the "A_2" micritic dolomite unit to the "B_2" arenaceous dolomite and is related to known mantos in that horizon. Four hundred feet southeastward at the section cut by drill holes No. 6, 7, 8 and 9 (Fig. 7), the breccia zone is more stratiform, having an apparent horizontal dimension of 300 feet and a maximum height of 50 feet.

On their edges, the breccia matrices are filled with sphalerite, dolomite spar and quartz. As the high grade core is approached, sphalerite becomes dominant and replaces most of the breccia fragments and matrix constituents. Minor late stage fillings of white vitreous quartz accompanied by red sphalerite are present and the unreplaced breccia fragments are frequently completely silicified. Sphalerite occurs as coarsely crystalline aggregates, colloform and botryoidal growths and as floating crystals which occassionally form "snow-on-roof" textures.

Mantos

This type of mineralization consists of fracture fillings, disseminations and crystalline vug fillings of sphalerite that is mainly red in colour. It forms lean, irregular concordant zones several tens of feet in thickness that generally contain less than 5 per cent zinc, and in contrast to the higher grade breccia, is not particularly siliceous. A series of these mantos were intersected along Section ZZ_1 (Fig. 8), for a distance of 2,000 feet, where they average approximately 40 feet in thickness and contain 2 per cent zinc. They appear to have formed as weak fracture systems or crackle breccias along selected beds outward from the walls of the heavily mineralized collapse breccia.

The mantos generally occur in areas of vuggy secondary dolomitization which are characteristically porous. However, the dolomitization is far more extensive than the mineralized mantos.

Bedded Sphalerite

Finely disseminated sphalerite is contained in dense, rhythmically banded light and dark layers of silica which appear to have been precipitated as a gel. This type of mineralization occurs within and adjacent to the HAB breccia and about 2,000 feet to the west where the presence of a similar

breccia is suspected. This type of material was encountered in drill hole No. 6 (Fig. 7) where it is 16 feet thick and contains 8 per cent zinc. It has a restricted lateral extent and is believed to have been deposited in a quiet aqueous environment on the bottom of an open cavern more or less contemporaneously with the filling of vugs, fractures and breccia matrices, elsewhere in the local paleokarst environment.

The presence of finely layered sphalerite and silica with well developed primary bedding features raises the possibility that it was deposited syngenetically with the enclosing carbonate strata. However, an open space filling mode of deposition is more likely because it explains other, more abundant types of mineralization on the property in particular, and many other carbonate-hosted zinc deposits in general. In addition, it seems unlikely that such a delicate sediment would co-exist with the nearby pisolitic dolostones which seem to have been deposited in a shallow environment subject to considerable wave action.

A second type of bedded mineralization is composed of rounded, detrital sphalerite grains of sand size that are cemented by silica. It is hard, cross bedded, vaguely banded, and has a conchoidal fracture. One small outcrop of this material containing more than 30 per cent zinc was found in the upper part of the HAB zone. It is believed to have been formed by the erosion of pre-existing breccia mineralization and redeposited close to its source in the channel of an active underground stream.

Weathered Zones

The products of active chemical weathering extend to depths of up to 250 feet above 4,600 feet elevation, as evidenced by the occurrence of smithsonite and leached dolostone in drill core. During exploration the presence of zinc in both carbonate (smithsonite) and sulphide (sphalerite) form was recognized as an important metallurgical factor requiring special procedures in assaying 1,200 drill core samples. In addition to reporting the total zinc content in each case, the smithsonite component was leached from the sample by a weak acid solution and determined separately. Where more than 50 per cent of the zinc content is reported as soluble due to smithsonite content, the material represented by that sample has been classified as "oxidized". The oxidized parts of the deposits generally contain 1 to 10 per cent zinc and have well defined boundaries with limited transition zones of mixed smithsonite and sphalerite. The soft, friable character of the oxidized material prevented the production of reliably representative core samples.

Smithsonite zones occur on the upper flanks of the HAB highgrade breccia. This material is porous, light brown in colour and contains scattered plates and chips of vitreous white quartz. The quartz fragments are the only visible remnants of the original submassive mineralization and appear to have been substantially rearranged as a result of the breakdown of sphalerite to smithsonite, producing a potato chip texture that has been called "fluxo-breccia".

Lean fracture fillings and disseminations of smithsonite (± 1 per cent zinc) are widespread in the upper parts of the mineralized "A" horizon. These seem to be partly the result of weathered mantos as well as the redistribution of smithsonite by meteoric water during the breakdown of zinc sulphides.

A third deep weathering phenomenon results in soft, porous, leached, buff coloured dolostone which occupies about one-half of the "A_1" bituminous carbonate unit in the area of the drilling grid. It is composed of pulverulent, light brown dolomite and silica. It was encountered above the 4,600 foot elevation in ten drill holes and has an average thickness of 110 feet below the surface. Sections of this material are mineralized with smithsonite and sphalerite in six holes. The origin of the leaching and its relationship to the zinc mineralization are uncertain; however, original, lean concentrations of pyrite may have provided sufficient acid to account for the partial breakdown and discolouration of the dolostone by meteoric waters.

CONCLUSION

At Goz Creek, simple aggregates of sphalerite, silica and dolomite have been deposited in open spaces, which have formed in a shelf carbonate strata under relatively passive structural conditions, remote from any intrusive or volcanic event. For these reasons, the mineralization is classed as "Mississippi Valley" type, notwithstanding the presence of an unusually large proportion of silica and its relationship to a fault system. In summary, the important geological elements and events to which the Goz Creek mineralization is related are as follows:

1. Carbonate strata were deposited in a shallow marine environment on an active northwest trending basin-edge, hinge-line during at least two cycles of subsidence and uplift.

2. Low displacement, hinge-line-related faults were re-activated periodically during the deposition and diagenetic processes and formed the loci of paleokarst openings during two periods of uplift and subaerial exposure.

3. Zinc sulphide, silica and dolomite were introduced into the paleokarst openings during or following burial of the host carbonate sequence.

4. Exposure occurred during Larimide uplift and secondary zinc carbonates were subsequently formed and preserved due to the absence of glaciation above an elevation of 4,800 feet.

Any theory concerning the source and means of conduction of mineralizing fluids into the deposition sites is very speculative; however, two well known concepts bear some consideration:

Jackson and Beales (1967) have suggested with respect to the Pine Point ore field, that the metal source is stratigraphically equivalent basinal shale and that during compaction the metals migrated in connate brines into porous reefs peripheral to the basin and were deposited as sulphides in secondary openings such as collapse breccias. This idea is currently popular because it accommodates some recent thoughts on the volcanogenic deposition of base metal deposits in shale basin environments.

An earlier Pine Point concept, proposed by Campbell in 1966, is that hinge-line faults may have been conduits for the delivery of mineralizing solutions from a deep source as well as being important controls with respect to the development of reefal shelf carbonate strata and the preparation of open spaces in which the sulphides were deposited.

ACKNOWLEDGMENTS

The writer wishes to gratefully acknowledge the efforts of those geologists who carried out and assisted with the exploration program at Goz Creek from 1973 to 1975, and whose work has been extensively referred to in this presentation. The principal members of this group are Owen S. Hairsine, C. Michael Hamilton, Gordon G. Webb, Ross Lennox, John L. Lydon and Neil Campbell.

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GEOLOGY OF THE MACMILLAN TUNGSTEN DEPOSIT

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INTRODUCTION

MacMillan Tungsten is a contact metasomatic deposit in gently dipping Lower Paleozoic limestone and limestone breccia adjacent to a Cretaceous quartz monzonite stock. Four tabular tungsten skarn horizons contain total geological reserves of 30 million tons grading 0.9% WO_3.

LOCATION AND ACCESS

MacMillan Tungsten is located on the border of Yukon and Northwest Territories at a latitude of 63°17' and altitude of 1,800 m above sea level. The deposit lies within the Selwyn Mountains 10 km from the Canol Road and 660 km by road from Whitehorse.

HISTORY

The property was discovered and staked in September 1962 by J.F. Allan for Southwest Potash Corporation to cover the source of scheelite-bearing skarn float found in the headwaters of Cirque Lake Valley. Eighty-nine claims comprise the Yukon portion of the property, forming the following claim groups: PAT, BETTY, BORDER, PAR, PIT, DONNA, GULL.

Exploration work on the property conducted mainly between 1968 and 1973, includes geological mapping, 10,500 m of diamond drilling in 73 holes, and 735 m of underground exploration. Mill tests were carried out on a 300 ton bulk sample obtained underground. Preliminary feasibility studies, collection of weather data and a variety of environmental studies have been carried out since 1973.

REGIONAL GEOLOGICAL SETTING

Regionally, Late Proterozoic and Paleozoic miogeosynclinal strata are intruded by stocks of Cretaceous quartz monzonite. The miogeosynclinal strata were deposited in two distinct structural environments: the Mackenzie Platform to the northeast, where the predominant rock type is carbonate, and the Selwyn Basin to the southwest, where the predominant rock type is shale (Fig. 1). MacMillan Tungsten is situated in a zone of mixed shale and carbonate near the facies boundary separating these two environments.

Regional stratigraphic divisions which correlate with rocks at the MacMillan Tungsten deposit are: The Grit Unit, the Sekwi Formation and the Road River Formation (Fig. 2). The Upper Proterozoic Grit Unit, correlated with Unit 1 on the property, consists of shale and siltstone west of the carbonate-shale facies boundary shown in Fig. 1, but contains minor limestone east of this boundary. The Lower Cambrian Sekwi Formation, which lies conformably on the Grit Unit, consists of dolomite and dolomitic limestone on the Mackenzie Platform. This formation thins to the west and is not present west of the facies boundary shown in Fig. 1. At MacMillan Tungsten the Sekwi Formation may be absent or may be correlative with Unit 2B on the property. Mid-Cambrian to Mid-Devonian Road River Formation consists of shaly limestone in the Selwyn Basin and is time equivalent to formations of dolostone and

FIGURE 1

LOCATION AND REGIONAL GEOLOGY OF MacMILLAN TUNGSTEN

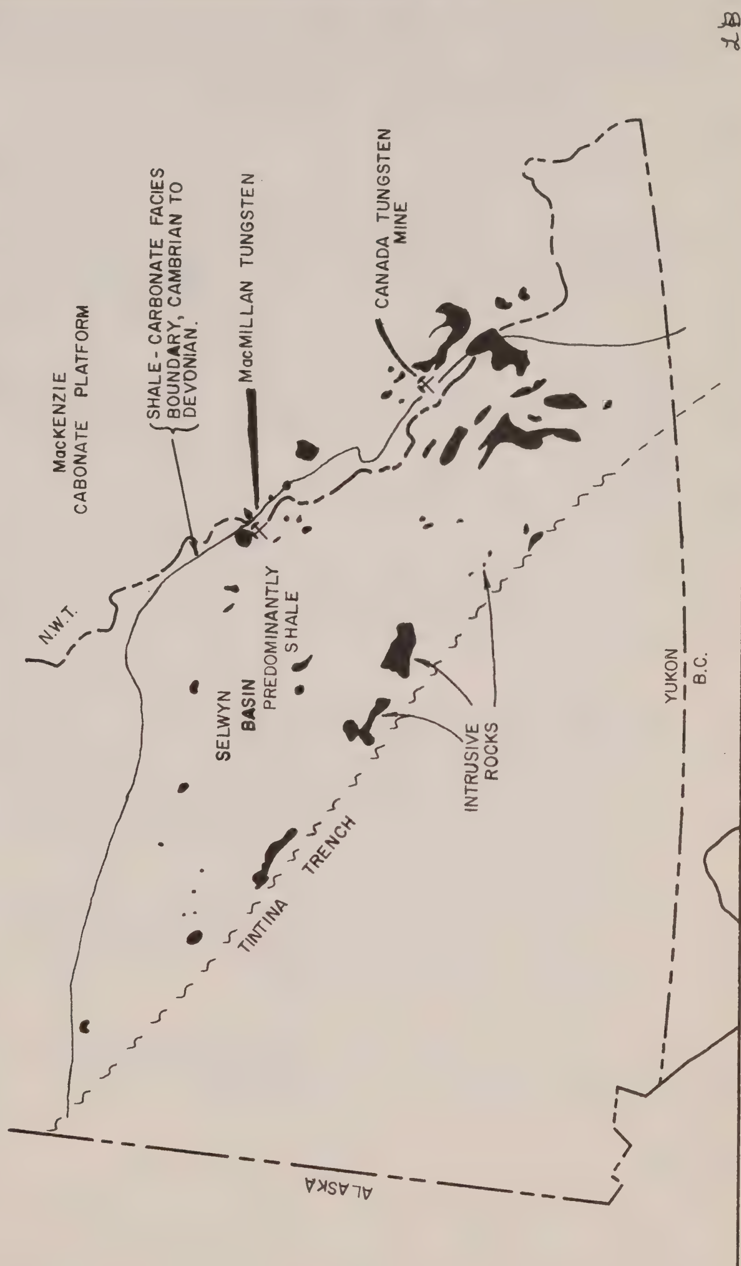
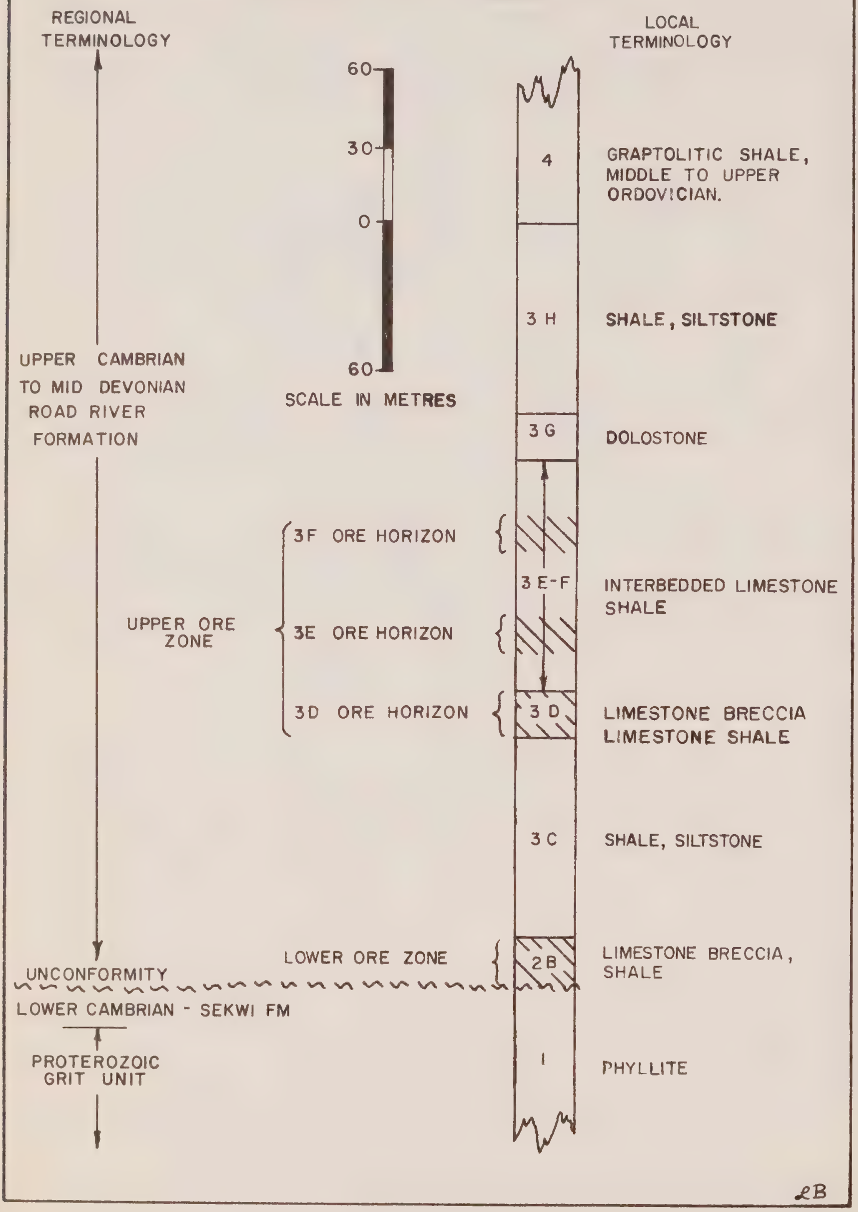


FIGURE 2

REGIONAL AND LOCAL STRATIGRAPHY, MacMILLAN TUNGSTEN



limestone on the Mackenzie Platform. Units 2, 3, 4 at MacMillan Tungsten are correlated with the Road River Formation.

Cretaceous intrusive rocks occur mainly within the Selwyn Basin, although tungsten deposits and prospects associated with these intrusions are concentrated along the eastern margin of the Basin where carbonate rocks are present. This region contains the Canada Tungsten Mine, the MacMillan Tungsten deposit and numerous skarn and vein tungsten occurrences.

LOCAL GEOLOGY

General Statement

At MacMillan Tungsten, phyllite is unconformably overlain by gently dipping limestone breccia, shale and carbonate. All rocks have been intruded by a quartz monzonite stock (Cirque Lake Stock) which altered shale to argillite or hornfels and carbonate to skarn. Property geology is shown in plan on Fig. 3 and in section on Fig. 4 and 5.

There are two ore zones: the Lower Ore Zone is a single scheelite skarn horizon, whereas the Upper Ore Zone contains three separate scheelite skarn horizons. Numerous quartz-scheelite and calcite veins occur in and near the ore zones. Zoning is indicated in the Lower Ore Zone by the distribution of skarn types and tungsten grade.

Stratigraphy

Unit 1 - Upper Proterozoic Unit 1, which is at least 750 m thick is thought to be equivalent to the Grit Unit. It is a grey mica phyllite composed of quartz, muscovite, biotite, chlorite and altered andalusite porphyroblasts. The contact between Units 1 and 2 is sharp and thought to be a Lower Cambrian unconformity.

Unit 1 is recrystallized to a spotted biotite hornfels near the contact with skarned Unit 2B. This recrystallized zone ranges from 0 to 24 metres thick, averaging 3.6 m. It consists of fine-grained brown hornfels with 4 mm wide clots of fine-grained biotite concentrated in layers 12 mm thick. Unit 1 is tourmalinized near the Cirque Lake Stock. Locally acicular black tourmaline crystals 2.5 cm long constitute 50 per cent of the rock.

Unit 2B is a limestone-shale slump breccia developed on the Precambrian basement. It is thought to represent the base of the Road River Formation but may be correlative with the Sekwi Formation. An 18 m section of unaltered Unit 2B, 300 m east of the mineralized zone, consists of limestone breccia with minor shale beds up to 1 m thick. The limestone breccia contains black shale fragments up to 10 cm across in a grey limestone matrix.

The sharp lower contact between Units 2B and 1 is considered to be an unconformity because of the abrupt change from foliated rock of Unit 1 to non-foliated rocks of the overlying units. The upper contact of Unit 2B is sharp and conformable.

Near the Cirque Lake Stock Unit 2B has been altered to scheelite skarn and forms the Lower Ore Zone. In the skarned area 2B is from 0 to 35 m thick, averaging 9.5 m. From its exposure on the North Face of Mount Allan (Fig. 4) Unit 2B dips 20° south for 210 m, is contorted into a recumbent fold and finally pinches out 360 m south of the North Face. This abrupt pinchout is considered to be either an original sedimentary feature or a large scale boudinage structure.

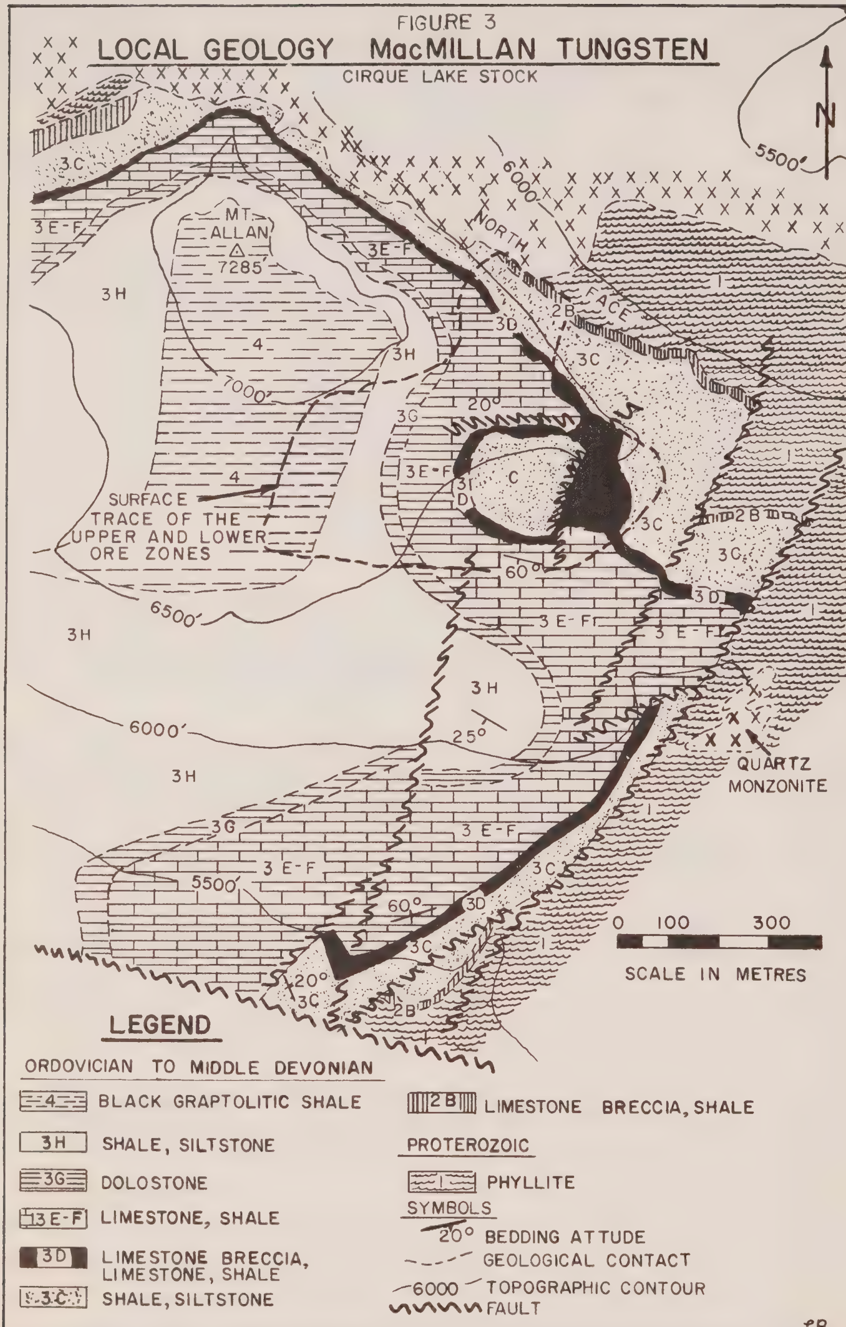


FIGURE 3
LOCAL GEOLOGY MacMILLAN TUNGSTEN
CIRQUE LAKE STOCK
N
5500'
6000
NORTH FACE
MT. ALLAN
7285'
7000'
6500'
6000'
5500'
3C
3E-F
3H
4
2B
3D
3G
C
1
20°
60°
25°
SURFACE TRACE OF THE UPPER AND LOWER ORE ZONES
QUARTZ MONZONITE
0 100 300
SCALE IN METRES
LEGEND
ORDOVICIAN TO MIDDLE DEVONIAN
4 BLACK GRAPTOLITIC SHALE
3H SHALE, SILTSTONE
3G DOLOSTONE
3E-F LIMESTONE, SHALE
3D LIMESTONE BRECCIA, LIMESTONE, SHALE
3C SHALE, SILTSTONE
2B LIMESTONE BRECCIA, SHALE
PROTEROZOIC
1 PHYLLITE
SYMBOLS
20° BEDDING ATTUDE
GEOLOGICAL CONTACT
6000 TOPOGRAPHIC CONTOUR
FAULT
LB

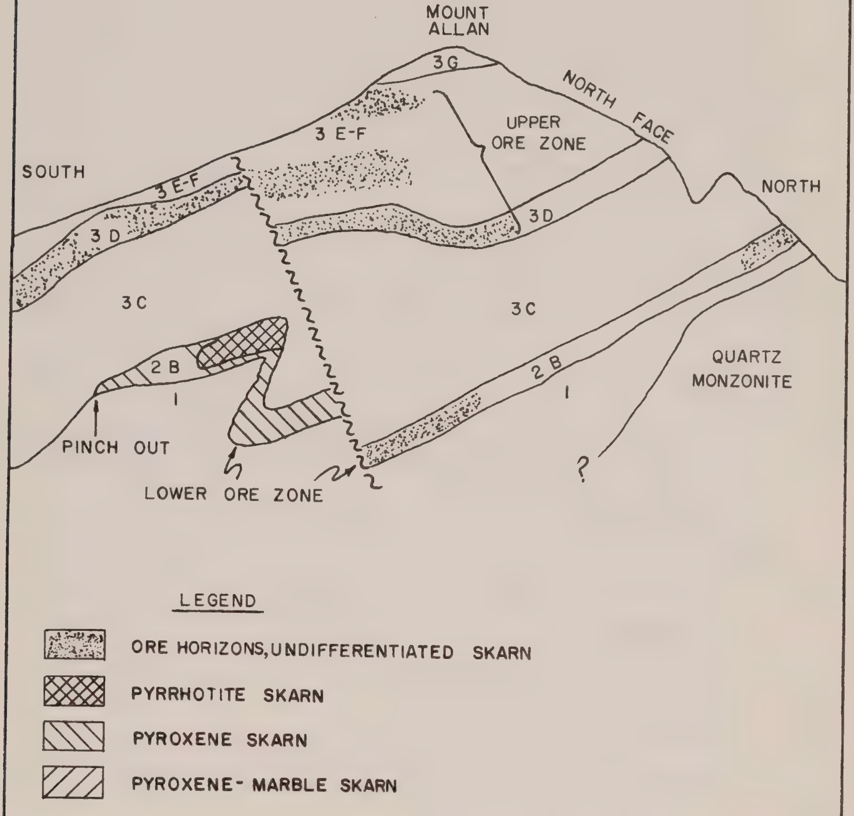
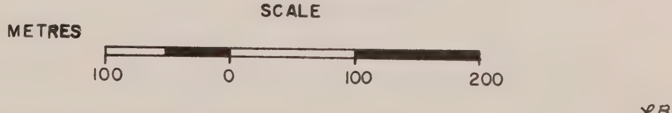


FIGURE 4

NORTH-SOUTH CROSS SECTION.
MacMILLAN TUNGSTEN
LOOKING NORTH



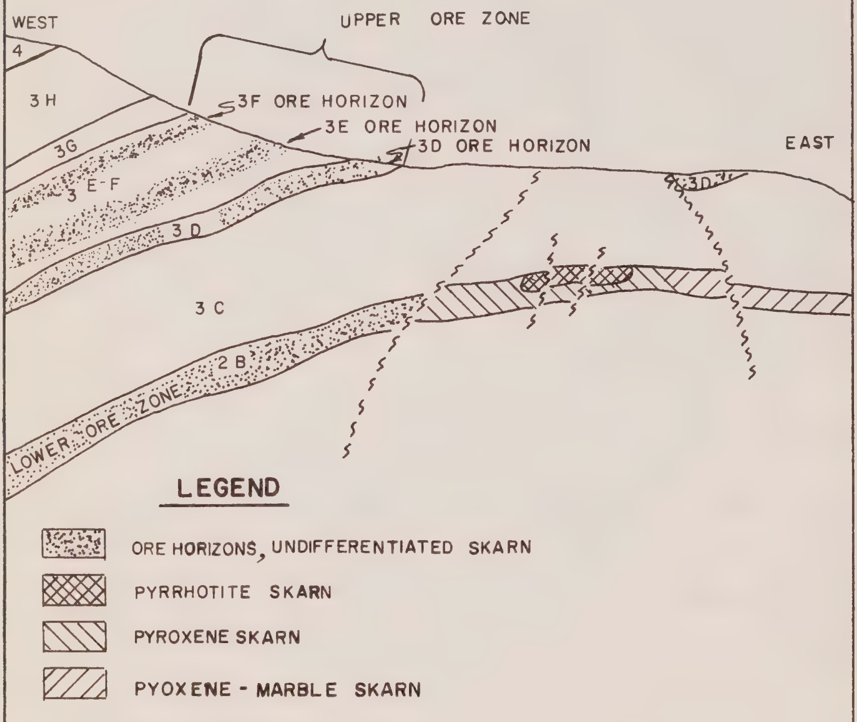


FIGURE 5

EAST - WEST LONGITUDINAL SECTION
MacMILLAN TUNGSTEN
LOOKING NORTH

SCALE

METRES 100 0 100 200

LB

Since underground exploration has been confined to skarned 2B (the Lower Ore Zone) this unit has been mapped in the most detail and has been subdivided into five skarn types. Pyroxene-marble skarn, pyroxene skarn and pyrrhotite skarn form a continuous series in terms of increasing degree of metasomatic alteration and increasing amount of scheelite. Minor cherty skarn and chlorite skarn occur with the three main skarn types.

Pyroxene-marble skarn is found at the eastern portion of skarned Unit 2B where it comprises approximately 20% of the unit (Fig. 5). It is composed of grey marble and cherty skarn fragments, in a matrix of pyroxene-tremolite skarn. Scheelite is low grade and restricted to the matrix

Pyroxene skarn is the dominant skarn type (approximately 70%) in Unit 2B (Figs. 4 and 5). The major minerals are pyroxene and quartz, with minor amounts of pyrrhotite (less than 15%), scheelite, chalcopyrite, garnet and carbonate, and trace amounts of wollastonite, tremolite and sphene. Grossularite-rich pyroxene skarn occurs as small pods (up to 1.5 m) within pyroxene skarn and may represent metasomatized fragments of pelitic sediments. Pyroxene skarn contains approximately 15% cherty skarn fragments, thought to be altered shale, and rare fragments of spotty biotite hornfels derived from Unit 1. Scheelite is disseminated through the pyroxene skarn and is concentrated along bedding planes and fragment margins. Garnet-rich patches, cherty skarn fragments and hornfels fragments within the pyroxene skarn contain only traces of scheelite.

Pyrrhotite skarn makes up approximately 10% of the total skarn in Unit 2B and forms the high grade core of the Lower Ore Zone (Figs. 4 and 5). Contacts between pyrrhotite and pyroxene skarn are arbitrarily placed where pyrrhotite exceeds 15%. Pyrrhotite skarn is fine- to medium-grained and consists of quartz, pyrrhotite (15 to 50%), pyroxene, scheelite and minor chalcopyrite (up to 1.5%). Although pyrrhotite skarn appears massive, the distribution of scheelite outlines relict banding and breccia fragments.

Cherty skarn occurs as fragments and rare bands within the three main skarn types. It is hard aphanitic light green rock composed of quartz, pyroxene, and minor garnet, pyrrhotite, and scheelite.

Chlorite skarn is a soft, incompetent rock which occurs in minor amounts in and near post-mineral faults. It is superimposed on all other skarn types.

In going from one of the main skarn types to chlorite skarn the mafic minerals are altered to chlorite, pyrrhotite is altered to pyrite but the scheelite content remains constant.

Unit 3C consists of thinly bedded, fissile black shale and siltstone with rare lenses and beds of limestone which occur in the upper and lower portions of this 60 to 90 m thick unit. The 3C-2B contact is sharp and conformable while the 3C-3D contact is gradational and conformable.

Within the alteration zone, Unit 3C consists of irregular zones and wedges of massive black argillite within brown hornfels. Black argillite, the weakly hornfelsed equivalent of shale and siltstone, has a weak conchoidal fracture and contains pyrite and pyrrhotite as disseminations or concretions. Bands in the argillite contain 1 to 2 mm rectangular pseudomorphs of white mica after andalusite (?). The more intensely altered brown hornfels is composed of quartz, plagioclase, biotite, muscovite, pyrrhotite and chalcopyrite. Brown hornfels contains light grey lenses thought to be siltstone boudins. Limestone beds and lenses with Unit 3C are skarned but are too small to be of economic value.

Unit 3D ranges from 10 to 27 m thick and is characterized by limestone-shale breccia beds intercalated with well bedded grey limestone and black shale. Limestone-shale breccia beds are from 2.5 cm to 1 m thick, make up an estimated 25% of Unit 3D and are composed of subangular to subrounded shale fragments in a grey limestone matrix. The upper and lower contacts of Unit 3D are gradational and are respectively placed at the topmost and lowermost breccia bed.

Near the Cirque Lake Stock, Unit 3D is the lower ore horizon of the Upper Ore Zone. Altered Unit 3D rock types in this zone are: skarned breccia, interbanded cherty skarn and pyroxene skarn, light coloured hornfels and black argillite. Skarned breccia consists of fragments of cherty skarn, hornfels, and rare vein quartz in a matrix of pyroxene skarn. Scheelite is evenly disseminated in skarned breccia and pyroxene skarn.

Unit 3E-F was originally separated into Unit 3E and Unit 3F but it is now recognized as a single unit of interbedded limestone and shale, averaging 90 m thick. An ideal section from bottom to top contains 18 m of black shale with rare limestone beds, 24 m of interbedded black shale and limestone, 18 m of black shale with rare limestone, 27 m of interbedded limestone and black shale, and 3 m of pyritiferous black shale. The Upper 3E-F contact is sharp and conformable whereas the lower contact is gradational.

Near the Cirque Lake Stock the two limestone-rich sections of Unit 3E-F are the two upper ore horizons of the Upper Ore Zone. Within these horizons, limestone beds up to 25 cm thick are altered to dark green pyroxene skarn with disseminated scheelite while intervening black shale is altered to black argillite or light grey hornfels.

Unit 3G is a resistant 18 m thick bed of black to grey dolostone with sharp, conformable upper and lower contacts. Within the skarn zone Unit 3G is a grey quartz-talc-tremolite hornfels with only a trace of pyroxene and scheelite.

Unit 3H, with an average thickness of 74 m, is comprised of thinly bedded pyritiferous black shale, siltstone and rare lenses of grey limestone. The upper contact is gradational but the lower contact is sharp.

Hornfelsed Unit 3H is generally black argillite which contains 2 mm wide white spots of fine-grained muscovite. Light grey to brown hornfels represents more intensely altered Unit 3H.

Unit 4 is a thinly bedded graptolitic black shale which forms the peak of Mount Allan. This unit contains no limestone and is not altered. Middle to Upper Ordovician graptolites from this unit have been identified by the Geological Survey of Canada.

Intrusive Rocks

The Cirque Lake quartz monzonite stock and related dykes cut all sedimentary rocks on the property.

The Cirque Lake Stock measures 2.4 km by 1.2 km with its long axis striking east. A potassium-argon date of 89 m.y. has been determined by the G.S.C. on biotite from the stock. On the north facing slope of Mount Allan the intrusive contact parallels bedding. The only drill hole intersection of the Cirque Lake Stock at depth is located 150 m south of the North Face of Mount Allan and indicates that the contact is approximately parallel to bedding. The deepest drill hole stopped 90 m below Unit 2B and although it penetrated

numerous quartz monzonite dykes it did not reach the stock. The attitude and depth of the intrusive contact beneath the ore zones is therefore unknown.

Two phases of quartz monzonite are recognized in the Cirque Lake Stock; a sub-porphyritic variety which predominates, and a younger medium-grained massive phase. Sub-porphyritic quartz monzonite contains 10% orthoclase perthite phenocrysts 10 mm long and 3% quartz phenocrysts 5 mm across. The medium-grained phase and matrix of the porphyritic phase are similar, with a massive granitic texture, 2-5 mm grain size and a modal composition of potassium feldspar (35%), plagioclase (24%), quartz (33%), biotite and chlorite (5%) and accessory amounts of apatite, fluorite, zircon, muscovite, allanite and scheelite.

A few porphyritic or medium-grained massive quartz monzonite dykes, mineralogically similar to the Cirque Lake Stock, cut all units. They are most abundant in Unit 1 beneath the ore zones.

Structure

Sedimentary strata and the conformable ore horizons have an average strike and dip of N55°W, 20°S. Strata in the mineralized zone are deformed by one recumbent fold and steeply dipping normal faults.

The recumbent fold, identified only in the Lower Ore Zone, has an axis which strikes N80°E and plunges 10°W (Figs. 4 and 5). This fold has elevated the southern limb 60 m above the northern limb; its central limb is only one metre thick at its thinnest point.

Small folds and crenulations throughout the property strike northeast and plunge 5 to 10° southwest.

The pinchout of the Lower Ore Zone is coincident with an abrupt steepening in the dip of the beds from 20°S to 50°S (Fig. 4). The beds flatten to 20°S again further south.

The skarned area is broken into numerous blocks by northeast, northwest and easterly striking normal faults. The faults postdate skarning and displace contacts from 1 to 45 m (Figs. 4 and 5).

Ore Zones

The orebody contains geological reserves of 30 million tons at 0.9% WO_3 and is comprised of the Lower Ore Zone of one horizon and the Upper Ore Zone of three horizons. The Lower Ore Zone is separated from the Upper by an average of 78 m of barren hornfels (Unit 3C).

The Lower Ore Zone, with geological reserves of 7 million tons at 1.48% WO_3 and 0.25% Cu is defined on three sides but is open to the west (Figs. 4 and 5). The upper and lower boundaries of the ore zone are sharp and coincident with contacts of Unit 2B.

Zoning of skarn types and scheelite grade is evident in the Lower Ore Zone. High grade pyrrhotite skarn is located at the apex of a dome in the Lower Ore Zone. Pyrrhotite skarn is surrounded by intermediate grade pyroxene skarn, which in turn is bounded by low grade pyroxene marble skarn to the east (Figs. 4 and 5). Western limits of the Lower Ore Zone have not been defined so it is not known if the zoning will be reflected to the west.

The Upper Ore Zone consists of three separate skarn horizons. The 18 m thick Unit 3D forms the lowest horizon, while two limestone-rich sections of Unit 3E-F with thicknesses of 24 m and 27 m form the middle and upper horizons, respectively. Each ore horizon is separated by 18 m of barren argillite and hornfels.

In the Unit 3D ore horizon, scheelite is disseminated in skarned limestone breccia beds up to 1 m thick and in skarned limestone beds up to 25 cm thick.

The two upper ore horizons are similar in that scheelite-bearing pyroxene skarn is in layers up to 25 cm thick separated by barren hornfels or low grade cherty skarn.

Veins

Quartz, calcite and zeolite veins, which may contain scheelite, pyrrhotite, tourmaline, chalcopyrite, molybdenite or pyrite, cut all altered rocks and the Cirque Lake Stock but are most abundant above and below the Lower Ore Zone (up to 36 per m) and within the Upper Ore Zone. Although many veins contain scheelite they contribute little to the grade of the deposit because of their small volume relative to the skarn. Details of vein type are tabulated (Table 1). General observations are listed below.

1. The mineralogy of a vein is generally similar to the mineralogy of the host rock. Most calcite veins are in skarn and most quartz veins are in pelitic hornfels.

2. Calcite veins and chloritized skarn are frequently in fault zones up to 4.5 m wide.

3. There are at least two and probably more ages of quartz veins. The oldest veins are parallel to bedding and have been folded and offset by faulting. They are cut by quartz veins that are typically wider, more continuous and more steeply dipping.

ORIGIN

MacMillan Tungsten is a contact metasomatic skarn deposit formed by the interaction of magmatic hydrothermal fluids and limy sedimentary rock.

Three factors were important in the formation of this deposit: a tungsten-rich stock, carbonate rocks in contact with the stock which localized the precipitation of tungsten-rich fluids, and a plumbing system through which solutions were transported from the stock to the carbonates.

In a study of the primary distribution of trace elements in plutons, R.G. Garrett (1970) sampled 74 felsic plutons in the Selwyn Mountains. Fifty-three samples from the Cirque Lake Stock ranged from 1.0 to 80.0 ppm W with a mean value of 3.5 (sixth highest of the 74 plutons) indicating that the Cirque Lake Stock contains an above average amount of tungsten. The 3-5 ppm mean value represents the residue in the stock, after removal of the tungsten-rich hydrothermal solutions.

The host rock must be permeable so that tungsten-rich solutions from the stock can be transported to a large volume of carbonate rock. At MacMillan Tungsten this permeability was accomplished by faults, fractures, bedding planes and porous limestone breccia. Fracturing of the host rocks was im-

TABLE 1. Vein Data, MacMillan Tungsten

Type	Width	Unit(s) Where most Abundant	Accessory Minerals	Relative age	Peripheral Alteration
Quartz	1-300 mm	3C,1,3E-F	Calcite, dolomite, pyrrhotite, tourmaline, scheelite	At least 2 ages	A. Pyroxene skarn rims (4-100 mm wide) are best developed in limestone B. Light brown hornfels rims are developed in argillite C. Spotted biotite hornfels rims are developed in brown hornfels
Calcite	2 mm to 1 m	2B	Pyrite, chlorite	Younger than quartz veins	Chlorite and pyrite
Zeolite (Chabazite & natrolite)	1-4 mm	3C,3E,-F	Carbonate	Younger than quartz and calcite veins	None
Quartz-tourmaline	2-4 mm	Throughout the Cirque Lake Stock	50% contain up to 10% scheelite	?	A few have rims of coarse-grained muscovite and pyrite up to 25 cm wide
Quartz-molybdenum	2-50 mm	Margin of the Cirque Lake Stock	-	?	None

proved by the numerous shale beds, intercalated with the carbonates, which deformed in a brittle manner leaving open fractures.

The following sequence of events is thought to have taken place at MacMillan Tungsten.

1) The Cirque Lake quartz monzonite stock intruded phyllite, black shale and carbonate rocks. The intrusion caused the sedimentary strata to be folded, faulted, fractured and thermally metamorphosed.

2) The margin of the stock crystallized and tungsten was concentrated in residual hydrothermal solutions.

3) Tungsten-rich hydrothermal solutions escaped from the partially crystallized stock and penetrated the sedimentary rocks along fractures, faults, bedding planes, and porous sedimentary strata. Within Unit 2B these solutions migrated through carbonate-shale breccia and were concentrated at the apex of a dome where they formed high grade pyrrhotite skarn.

4) With waning temperatures, zeolite crystallized along fractures. Steeply dipping faults disrupted the skarn and chlorite, calcite and pyrite were developed along some of these late structures.

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The writer wishes to thank AMAX Minerals Exploration for permission to publish these results.

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GEOLOGY, LODE AND PLACER GOLD MINERALIZATON OF THE MOOSEHORN RANGE, 115 N 2

By
J.A. Morin

INTRODUCTION

In 1974, the discovery of visible gold in quartz veins from the Moosehorn Range sparked interest in the area, both for lode vein and placer gold potential. During the spring and summer of 1975, follow-up geochemical and geophysical surveys, trenching and diamond drill programs were carried out on the discovery area by Great Bear Mining Company Limited and Claymore Resources Limited. Along with the bedrock exploration, evaluation of the placer potential was conducted by Claymore and to a lesser extent by Great Bear.

The present geological report summarizes results gathered from six days of field work in late September 1975 and one week in summer 1976.

LOCATION AND ACCESS

The report area is located in the western half of the Ladue River area, 115 N 2, east of the Alaska-Yukon border, approximately bounded by latitudes 63°00'N - 63°15'N and 140°40'W - 141°00'W. The Great Bear and Claymore Resources showings are situated in the southwest corner of this area, approximately at 140°55'W and 63°00'N. Access to the area is provided by fixed-wing aircraft from Whitehorse, 405 km to the southeast to a private airstrip owned by Claymore Resources on the west side of the Moosehorn Range. A 65 km winter tote road connects the property to Scottie Creek on the Alaska Highway in Alaska. Float-based, fixed-wing aircraft may land at Wienerwurst Lake (local name) about 14 km southwest of the main showing areas. Loads may be slung by helicopter the remaining distance to the camps.

PHYSIOGRAPHY

The Ladue River area consists of gently rolling flat-topped hills and ridges - a mesa and butte topography. Two ridges dominate the landscape: the Moosehorn Range to the west, trending N-NW and up to 4,439 feet in elevation and an unnamed range west of Seven Mile Creek up to 5,231 feet in elevation, trending north, and bifurcating with one branch to the N-NW.

The area has not suffered continental glaciation, and as a result, many of the surface rock outcrops are eroded into small pinnacles termed tors. Ridge tops are covered by large angular, blocky, frost-heaved boulders collectively termed felsenmeer. The boulders in felsenmeer are almost in situ and their distribution can be used for geological mapping. Pre-glacial erosion and weathering has resulted in the accumulation of a residual soil which has been transported to the lower slopes of the ridges by the combined processes of sheet runoff and solifluction. This residual soil is widespread and concentrated between the ridge tops and the stream valleys.

Above an elevation of 4,000 feet, vegetation is sparse and consists of lichen, moss and small shrubs. Between 3,500 to 4,000 feet, vegetation consists of waist-high brush (buckbrush) with sparse spruce. Thick poplar, spruce and alders dominate the vegetation between the stream banks (2,000 feet) and 3,500 feet. The stream banks of Ladue River and Claymore Creek (local name for stream immediately east of Moosehorn Range) are heavily populated with spruce, clumpy mosses and grass.

Drainage in the area is provided by the Ladue River which flows southeasterly into the White River, a major river of Yukon Territory. The Ladue River is a meandering stream with well developed sand and point bars and numerous oxbow lakes. Meander wavelength and amplitude are in the order of 1 kilometre and 0.5 to 1 kilometre respectively. The channel is flat bottomed and varies from 1 to 1.3 km in width, whereas the stream is about 30 to 60 metres wide. The river appears to migrate from one side of the channel to the other, with a wavelength in the order of ten kilometres.

The main local tributary to the Ladue River is a northerly trending creek immediately east of the Moosehorn Range, here referred to as Claymore Creek. The creek is about 22 km long and has a poorly developed meander throughout most of its length. Its width is usually less than 10 metres, whereas its meander wavelength and amplitude are on the order of 100 to 300 metres and 100 to 200 metres respectively. The creek channel is about 1 km wide and in the last 13 km of its length, the creek runs adjacent to the east bank of the channel. As with the Ladue River, vegetation is common in the creek channel. Elevations along the creek from head to mouth are 2,160 feet and 1,400 feet respectively, yielding a gradient of 10.4 m/km or 56 ft/mile.

The local topography on the Moosehorn Range can be subdivided into four topographic regimes:

1) Ridge Crests - These form the backbone of the Range and occur above an elevation of 3,800 feet. They consist of extensive felsenmeer and tors with sparse grass vegetation.

2) Intermediate slope - These areas occur between an elevation of approximately 3,800 feet to 3,400 feet and have an extensive buckbrush cover. Intermittent streams of high energy are developed in this slope which commonly hosts the headwater streams of the local drainage system. On the Claymore property, the headwater spurs for Kenyon Creek occur on this slope, and a well developed residual soil found here.

3) Lower slope - This is the laterally most extensive portion of the topographic profile and extends from about 3,400 feet to 2,500 feet. Creek gradients decrease sharply at the top of this slope. The slopes have a relatively low grade, are lobate in plan and at right angles to the Range. Vegetation consists of extensive buckbrush and alders with poplars developed on the south facing side and spruce on the north facing side. The margins of solifluction lobes (?) on the slope are marked by narrow strips of spruce running transverse to the long axis of the lobes. This lower slope consists of residual soil overlain by gravels of probable solifluction origin. It may be the old base level of the area prior to its most recent uplift.

4) Stream valley - The stream valleys are flat bottomed (not V-shaped like the creeks) and straight, though the courses of the streams are commonly meandering. Muskeg and spruce are abundant and consequently the streams provide very poor drainage.

Previous Work

Geological mapping of the area has been done by W.E. Cockfield (1921, north of Ladue River only) and D.J. Tempelman-Kluit (1974). Tempelman-Kluit's work involved reconnaissance scale geological mapping (1:250,000) of the Aishihik Lake, Snag and western portion of the Stewart River map area.

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Photograph of west side of Moosehorn Range, Kenyon Creek in middle and north fork of Swamp Creek at extreme right. Placer workings in centre. Note ridge top, intermediate slope and lower slope.

General Geology

The geology of the area consists of metasedimentary rocks intruded by rocks of the Klotassin Batholith and locally overlain by volcanic flows of the Carmacks Group.

Metasedimentary Rocks

Sedimentary rocks in the area are metamorphosed to the amphibolite facies. Rock types include biotite-quartz-feldspar schist and amphibolite, and visually estimated representative modes are presented in Table I.

The Klotassin Batholith is in contact with the metasedimentary rocks in the northern portion of the area, but nowhere is the contact visible. Inclusions of metasedimentary rocks are common in the early hornblende granodiorite of the Klotassin Batholith.

Klotassin Batholith

The Klotassin Batholith is a northwest trending mass of granitic rocks extending over 300 kilometres. It is heterogeneous both structurally and compositionally and has been described by Tempelman-Kluit (1974). Within the Ladue River area, the Batholith consists of several phases:

1) an early foliated hornblende (± biotite) granodiorite to quartz diorite;
2) massive equigranular to porphyritic plutons of biotite-hornblende granodiorite and of quartz monzonite;
3) late granodiorite and quartz-diorite porphyry dykes and plugs.

Relations between the above three rock types have not been observed in outcrop but are inferred from their position in felsenmeer float.

Early Hornblende Granodiorite

The hornblende granodiorite-diorite occurs throughout most of the Klotassin Batholith and is regarded by Tempelman-Kluit (1974) as the most widespread and earliest phase of plutonic activity within the Batholith. Throughout the Ladue River area, this unit is extensively foliated with coarse-grained plagioclase, hornblende and biotite grains lineated in the plane of foliation. The rock weathers to a drab greyish-brown and commonly shows parting parallel to the plane of foliation.

Mineralogically, it conists of 50 per cent coarse-grained white plagioclase grains (0.5-1 cm) which are commonly bent or broken (see Table II). Secondary albite-twinning with wedge-shaped curved lamellae are common and in some rocks, normal and normal oscillatory zoning are common. K-feldspar ranges from nil to 20 per cent and consists of interstitial, subhedral to anhedral, medium-grained and locally poikilitic microcline perthite. Quartz ranges from 5 to 35 per cent in abundance and occurs as coarse-grained lenticular aggregates of foam-textured grains aligned parallel to the foliation. The mafic minerals (10 to 40 per cent) consist of coarse green subhedral hornblende and lepidoblastic medium-grained brown biotite, some of which shows kink banding. Minor chloritic alteration of biotite is present and the common accessory minerals include magnetite, sphene, epidote and apatite.

Seven Mile Creek Stock

An elliptically-shaped stock of porphyritic quartz monzonite occurs immediately west of Seven Mile Creek. The stock is about 5 by 3 miles in size and is compositionally heterogeneous. The core consists of massive, coarse-grained, equigranular to porphyritic grey hornblende-biotite quartz monzonite with an average matrix grain size of 2 to 5 mm. K-feldspar occurs as white euhedral coarse-grained phenocrysts of orthoclase microperthite ranging from 1 to 2 cm in size and 20 to 50 per cent in abundance (see Table III). They are commonly twinned according to the Carlsbad law and are poikilitic with inclusions of hornblende, quartz, plagioclase and biotite. Myrmekite is developed at some of the contacts between K-feldspar and plagioclase. Plagioclase (30 to 50 per cent) is present as white, medium-grained, subhedral blocky shaped grains with trace to minor sericitization and moderately developed normal zoning. Quartz forms about 10 per cent of the rock and occurs as equant medium- to coarse-grained aggregates of anhedral, unstrained fine to medium sized grains with sutured boundaries. Mafic minerals include subhedral poikilitic green hornblende and brown partially chloritized medium-grained biotite. Accessory minerals include magnetite, apatite, epidote and sphene.

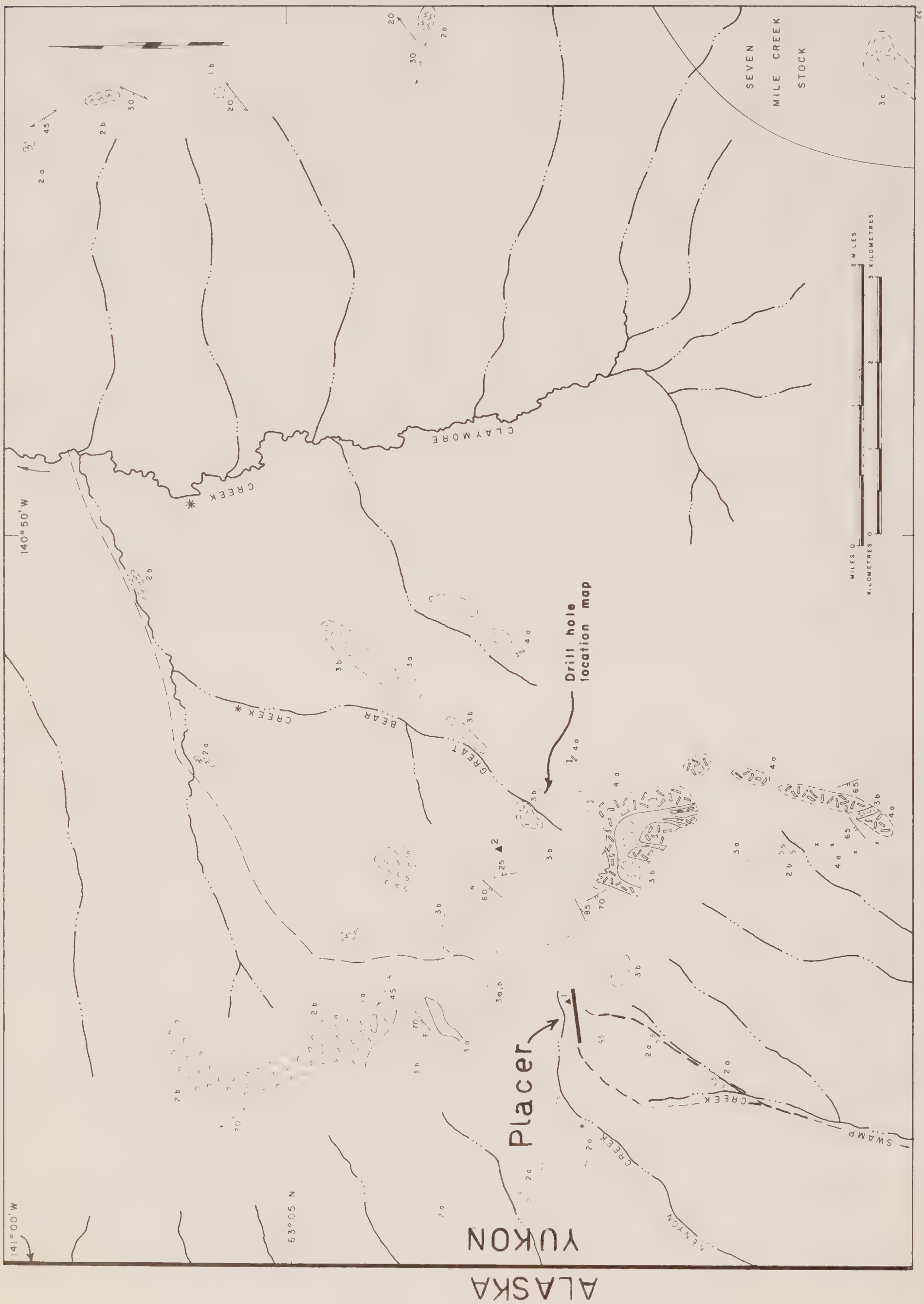
As the contact with the country rocks is approached, the rock becomes progressively foliated and lineated and mafic inclusions are deformed into disc shapes. An increase in total feldspar, the amount of mafic inclusions and number of thin white veins of graphically intergrown quartz and feldspar is also noted towards the contact. Situated between the porphyritic quartz monzonite and the foliated hornblende granodiorite country rock is a zone or halo about 150 feet wide of pale orange to rusty brown, massive equigranular, medium-grained granite. This halo was noted at both localities where the stock-country rock contact was traversed, and is due to the breakdown of brown biotite to orthoclase and magnetite accompanied by the subsequent oxidation of magnetite to hematite.

Moosehorn Range Granodiorite

A pluton of undefined outline (see geological map) occurs in the Moosehorn Range. It consists of massive medium- to coarse-grained equigranular biotite-hornblende granodiorite which weathers white and is composed of 5-30 per cent quartz, 20-40 per cent biotite and hornblende in varying proportions, with the remainder consisting of white feldspar (see Table IV). Plagioclase is the dominant feldspar and ranges from 40-50 per cent in abundance. It occurs as medium- to coarse-grained, euhedral to subhedral, strongly zoned grains. The zoning is normal to normal oscillatory and convolute patterns and resorption features are common. Sericitization is present in trace to moderate amounts. Quartz is an abundant constituent and occurs as coarse-grained (up to 1.5 cm) interstitial lensoid aggregates of medium-sized unstrained grains with sutured interlocking boundaries. K-feldspar is present as medium-to coarse-grained, subhedral to anhedral microcline perthite, mainly of an interstitial habit. Hornblende and biotite contents range from 10 to 20 per cent. The hornblende consists of subhedral stubby poikilitic green grains ranging up to 1 cm in size. Biotite is present as subhedral medium-grained laths, commonly chloritized. Accessory minerals include fine-grained epidote, magnetite, apatite and sphene.

Inclusions of amphibolite are locally common within the granite and where they occur, the granite is enriched in hornblende, thus suggesting that some if not all of the hornblende-rich phases of the granite may be due to assimilation.

2


SEVEN MILE CREEK STOCK
CLAYMORE CREEK
GREAT BEAR CREEK
SWAMP CREEK
Drill hole location map
Placer
140°50'W
141°00'W
63°05'N
YUKON
ALASKA
MILES
KILOMETRES

GEOLOGY OF THE MOOSEHORN RANGE, 115 N-2

LEGEND

4 Porphyritic Dyke Rocks
- a Quartz diorite, granodiorite porphyry

INTRUSIVE TO GRADATIONAL CONTACT

3 Massive Equigranular to Porphyritic Stock Rocks
- a Hornblende biotite granodiorite
- b Biotite granodiorite, quartz monzonite
- c Porphyritic quartz monzonite

GRADATIONAL CONTACT

2 Foliated Granitic Rocks
- a Hornblende biotite granodioritic, diorite
- b Biotite granodiorite

INTRUSIVE CONTACT

1 Yukon Group
- a Quartzite
- b Biotite quartz feldspar schist

SYMBOLS

Rock outcrop, mainly felsenmeer

20 Lineation

Foliation, inclined, vertical

Joint, inclined, vertical

Geological contact, assumed

Tote Road

Camp Location, 1 - Claymore
2 - Great Bear

Airstrip

Local creek name

Geology by J. Morin, 1976

RE

Granodiorite-Quartz Diorite Porphyry

Porphyritic granitic rocks are common in the southern portion of the Moosehorn Range. Their field relations are not obvious, but they are probably intrusive dykes into the granodiorite. However, the porphyritic phase does appear to grade into equigranular hornblende granodiorite over short distances locally. In addition, rounded xenoliths of porphyritic andesite occur within the porphyry locally, suggesting that the intrusions are hypabyssal.

The porphyries weather to a dark grey, are massive and consist of coarse-grained hornblende and white feldspar phenocrysts (0.5-1.5 cm) set within a fine- to medium-grained matrix of feldspar, biotite and quartz (see Table V). The phenocrysts are dominated by strongly zoned euhedral crystals of plagioclase ranging from 1 to 8 mm in size, with the average about 2 to 4 mm. More than 80 zoning shells were observed in a plagioclase phenocryst from sample K-047. K-feldspar phenocrysts are rare, but where present consist of coarse euhedral grains of microcline perthite. Biotite forms stubby equant medium-grained brown phenocrysts with ragged borders. Commonly, the biotite is partially altered to chlorite and magnetite and the stubby medium- to coarse-grained phenocrysts of green hornblende are locally altered to felted masses of actinolite. Quartz is present as fractured, equant, euhedral grains ranging from 1 to 8 mm in diameter. Accessory fine-grained magnetite, apatite and sphene are commonly associated with the mafic phenocrysts and to a minor extent, are disseminated within the matrix. The matrix is very fine-grained and consists of varying amounts of anhedral plagioclase, K-feldspar, quartz and biotite.

Discussion of Relationships Between Granitic Rocks

Several features of the granitic rocks suggest that the early deformed phases are related to the massive and porphyritic phases:

- similar zoning habit of plagioclase grains and phenocrysts;
- similar habit of hornblende grains;
- gradational contacts;
- chemical composition.

Zoned plagioclase is characteristic of the Moosehorn granodiorite and phenocrysts in the porphyritic dykes and plugs. In addition, similar looking plagioclase is present within the foliated hornblende-biotite granodiorite. Likewise, hornblende occurs as stubby green grains of similar habit within each rock type. Contacts between the Moosehorn granodiorite and foliated hornblende-biotite granodiorite are gradational and consist of a progressive increase in deformation and foliation intensity from the former to the latter. Similarly, the porphyritic granitic rocks locally grade into the Moosehorn granodiorite.

Chemical analyses of seven granitic rocks show a calc-alkaline trend on the AFM diagram. Harker variation diagrams demonstrate that the porphyritic, equigranular and foliated phases may all be related by a common differentiation trend line, with the exception of the porphyritic quartz monzonite of Seven Mile Creek Stock, which plots aberrantly for K_2O, CaO, FeO, Fe_2O_3 and Al_2O_3.

The granodiorite porphyry (K-44) and the Moosehorn granodiorite (K-71) have a remarkable similarity in composition (see Table I of chemical analyses), thus suggesting that texture is the main difference between them and that they have the same source magma. The samples of the deformed hornblende granodiorite (K-23, K-41) are very similar in composition. This may reflect a

very limited compositional range in this rock type, especially considering that the sample sites are 50 km apart.

The two samples from the Moosehorn Stock (K-71, GB-08) have a relatively wide compositional range, suggesting a fair amount of internal compositional differentiation within the stock.

The similarities and gradational contacts between the foliated, massive and porphyritic granodiorite suggests that they may have had a common magma source and that consequently, they differ only in texture and structure.

TABLE I

CHEMICAL ANALYSES OF GRANITIC ROCKS, MOOSEHORN RANGE

	K-23	K-41	K-44	K-46	K-52	K-71	GB-8
SiO_2	60.2	59.5	65.7	70.4	61.5	66.1	72.7
Al_2O_3	17.5	17.6	16.8	14.8	16.2	16.4	14.5
Fe_2O_3	3.27	3.81	1.93	1.09	3.96	2.46	1.03
FeO	3.91	3.96	2.96	3.85	2.68	2.81	1.84
MgO	3.00	2.80	1.42	0.70	2.52	1.58	0.35
CaO	5.20	5.70	4.50	2.40	4.70	4.65	1.90
Na_2O	3.00	2.70	3.20	2.85	3.40	2.70	3.05
K_2O	2.20	1.57	2.50	3.10	3.70	2.46	3.75
TiO_2	0.66	0.71	0.37	0.25	0.54	0.37	0.14
MnO	0.13	0.12	0.06	0.06	0.10	0.10	0.04
P_2O_5	0.21	0.20	0.14	0.11	0.35	0.16	0.57
L.O.I.	0.51	1.08	0.66	0.01	0.69	0.36	0.13
Total	99.79	99.75	100.24	99.62	100.34	100.15	100.00

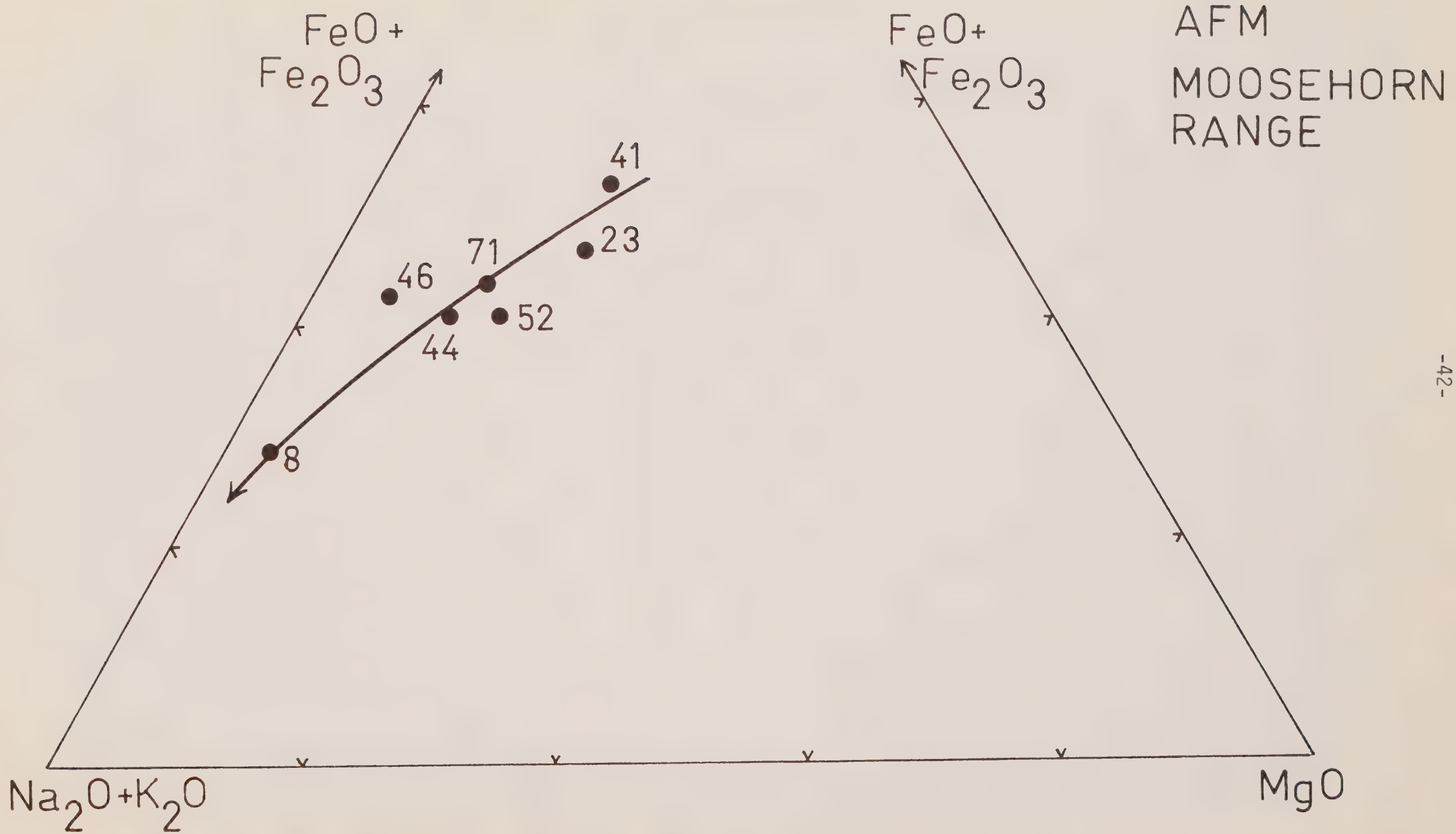
Note: K-23, 41 - Early hornblende granodiorite; K-44, 46 - granodiorite porphyry; K-52 - porphyritic quartz monzonite, Seven Mile Creek Stock; K-71, GB-8 - Moosehorn Range Granodiorite

Analysts: Bondar-Clegg and Company Limited, Vancouver, B.C.

Carmacks Group

Volcanic rocks of the Eocene (?) Carmacks Group occur in the southern portion of the study area. The rocks weather pale brown, are black on the fresh surface and are intensely jointed and fractured. The one locality visited consists of porphyritic fine-grained andesite with medium-grained phenocrysts of plagioclase, augite, biotite and K-feldspar within a fine-grained quartzofeldspathic matrix. The plagioclase phenocrysts (25 per cent) are euhedral, poikilitic and range in size from 1 to 3 mm. They exhibit trace to extensive alteration to sericite and patchy carbonate, are commonly fractured with tourmaline locally along fractures and show minor zoning. Augite (5 per cent) occurs as subhedral medium sized grains largely altered to fine-grained assemblages of biotite, chlorite and actinolite. Biotite (10 per cent) is present as 1 mm brown grains which are commonly bleached and accompanied by substantial amounts of fine-grained magnetite disseminated within the biotite or along its edges. K-feldspar (5 per cent) forms euhedral highly fractured poikilitic grains up to 3 mm in size that have been subject to minor carbonate and sericite alteration. The matrix (55 per cent) is fine-grained and appears to be quartzofeldspathic in composition with abundant disseminated fine-grained magnetite.

3


AFM
MOOSEHORN
RANGE
FeO+
Fe_2O_3
FeO+
Fe_2O_3
Na_2O+K_2O
MgO
41
23
71
46
52
44
8

Structure

The main structural features in the area are foliation (schistosity, gneissosity), lineation (mineral, mullion), jointing and miarolitic cavities.

Foliation is present in the metasedimentary rocks and in the early hornblende granodiorite phase of the Klotassin Batholith. In the metasediments the foliation is an alignment of micas and hornblende to produce schistosity and gneissosity. In one sample of biotite-quartz feldspar gneiss (K-021), two transecting foliations of biotite are evident. In the hornblende granodiorite, foliation and lineation consist of aligned hornblende, biotite and quartz grains. The foliation ranges from east-west to north trending, with consistently shallow dips, mainly to the west. The lineations vary from NE to NW at shallow plunges of 20 to 30°, and in addition to mineral lineations, some mullion are present in the hornblende granodiorite.

Lineation is also present in the porphyritic quartz monzonite stock west of Seven Mile Creek. The lineation occurs near the margin of the stock and consists of aligned K-feldspar grains. No outcrop occurs near the margin of the stock, but probably the lineation is parallel to the dip of the contact with the surrounding country rocks.

Jointing is common in the massive granodiorite of the Moosehorn Range and occurs to a lesser extent in the other rock types. The quartz vein-bearing joints commonly trend about 165 to 175° with shallow dips to the east. This trend is coincident with the aeromagnetic anomaly trend over the Moosehorn Range.

Cavities occur within the quartz veins in the Moosehorn Range granodiorite. They are not common and are up to several centimetres long and about one centimetre wide. Quartz crystals typically line the cavities along with minor sulphide minerals.

A narrow (10 m) approximately N-S trending zone of mylonite occurs within the seven Mile Creek Stock. In addition, a prominent hillside lineament in line with Claymore Creek (local name) occurs just west of the stock. This lineament coupled with the linear nature of Claymore Creek may indicate a N-S trending fault through Claymore Creek.

Aeromagnetic response from the rocks of the area is varied. The foliated hornblende granodiorite corresponds with generally low values of 57,340 to 57,460 gammas. The schists and gneisses in contact with the Klotassin Batholith to the north have generally higher average values with several anomalous areas up to 57,720 gammas, trending NW. The Seven Mile Creek Stock is represented by a roughly elliptical-shaped anomaly with values ranging from 57,330 to 57,720. Over the Moosehorn Range Stock a N-NW trending elongate elliptical anomaly coincides with the pluton and the trend of the Range. The values vary from 57,340 to 57,580 gammas.

Economic Geology

History

Gold mineralization in the Moosehorn Range was first found by float prospecting in 1970 by Quintana Minerals with the discovery of galena-sphalerite bearing boulders of vein quartz carrying visible gold. The area was staked as the SIL claims, but was allowed to lapse and was subsequently restaked by A. Harman in 1972 and transferred to Great Bear Mining Company Limited (DEA 1-42) in 1974. In summer 1974, geologist M. Kenyon prospected

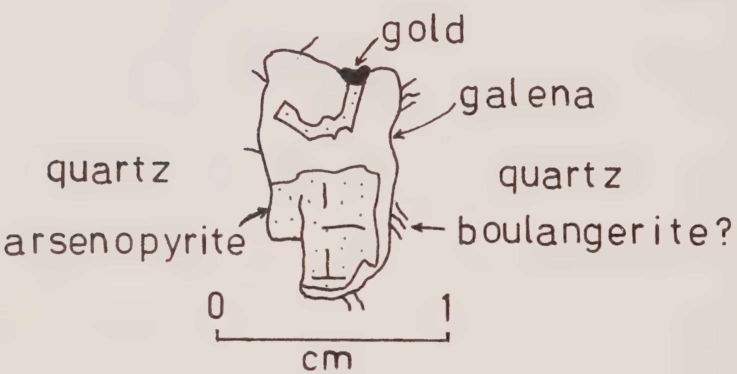
part of the Moosehorn Range and discovered visible gold southwest of the DEA claims. Later, in January 1975, this ground was staked by Claymore Resources as the LORI (1-58) group adjoining the DEA group to the west and south.

Mineralization

Mineralization in the Ladue River area is restricted (so far as known) to auriferous quartz veins in the Moosehorn Range granodiorite. The only mineralized veins found to date are on the DEA claim group of Great Bear Mining Company Limited and the LORI group of Claymore Resources. Milky white quartz veins of variable thickness (5 cm-0.5 metres) occur mainly along N-NW trending joints with shallow dips of 20 to 40°.

The sulphides occur as coarse-grained crystals, lenses and as streaky fine-grained bands within the quartz veins. Gold occurs as coarse equant anhedral grains up to 2 mm in size, commonly associated with galena, arsenopyrite and sphalerite. The general paragenetic sulphide sequence consists of early, subhedral to euhedral arsenopyrite crystals followed by galena, boulangerite and sphalerite. Locally, galena rims the arsenopyrite and is surrounded in turn by acicular crystals of boulangerite. Sphalerite is encrusted on boulangerite locally in quartz vugs. Quartz crystallized before, during and after sulphide deposition, and has formed crystal-lined vugs.

4



Sketch showing paragenetic relations between sulphide minerals and gold.

Wall Rock Alteration

Narrow zones of alteration are present in the granodiorite adjacent to the quartz veins. They range in width from a few centimetres to half a metre and are not proportional to the widths of the quartz veins themselves. The altered granodiorite is pale green and consists of sericite, quartz, carbonate, arsenopyrite and magnetite. Blocky shaped brown, pale green and white pseudomorphs after feldspar occur within the altered wall rock. They consist of the following:

1) greyish brown, very fine-grained carbonate masses with minor sericite;

2) pale green pseudomorphs made up of ribbon-like interfingering masses of sericite and carbonate with minor disseminated very fine-grained magnetite;

3) pale green and white pseudomorphs consisting entirely of felted masses of fine-grained sericite.

The alteration zone grades into the unaltered fresh host rock through a thin zone in which the sericite and carbonate alteration is less intense and portions of the original unaltered feldspar grains are still present.

Current Work and Results

In 1974-75, Great Bear conducted geological mapping, grid soil geochemical and geophysical surveys. More than one thousand soil samples were collected on a 51,000 foot by 2,700 foot area and analyzed for Pb, Zn, Ag and As. Coincident silver-lead anomalies were determined which corresponded to the known veins. In addition, anomalous linear trends for silver corresponded with the strike of known veins, float trains, magnetic, and to a lesser degree, eletromagnetic anomalies. The ground magnetometer survey determined several linear trends which were interpreted as faults (see 'I' and 'A' zone, drill hole location map). Several of the magnetic trends indicated faults intersect in regions of coincident geochemical anomalies and mineralized quartz veins. An electromagnetic survey (EM-16) was also conducted and moderate to moderately strong conductors were determined which coincided with the magnetic linear trends, geochemical anomalies and strikes of the mineralized veins. An extensive area (30 m x 600 m) on the northeast side of the hill was stripped with a D-7E bulldozer. Several trenches have been cut on the property and three main quartz veins carrying gold mineralization have been discovered, referred to as the 'D', 'B' and 'C' zones (see drill hole location map).

During summer 1975, 19 diamond drill holes with a total footage of 2,284 feet were drilled on the DEA claim group. In most instances, the quartz veins were intersected at depths less than 40 feet and the veins were narrow with low gold values. The best values obtained from the drilling are presented below:

Zone	DDH	Au oz/ton	Ag oz/ton	Width
B	16	7.49	1.16	6 in.
C	5	3.62	8.75	6.5 in.
D	2	1.6	12.4	3 in.

Several high grade bulk samples were taken from the D zone and B zone:

Description	Width (ft)	Length (ft)	Thickness (ft)	Au oz/ton	Ag oz/ton
81 lb sample of vein from B zone	0.4	5.0	0.7	9.25	2.06
261 lb sample of lower vein adjacent to footwall from D zone	0.35 avg.	4.0	1.5 avg.	20.01	12.67

In summer 1975, Claymore Resources conducted geological mapping, soil geochemical and minor geophysical programs on the LORI group. Using the claim lines as control about 300 soil samples were collected with a 300 foot spacing and analyzed for Pb, Zn, Ag. No anomalies were found to be associated with the known mineralized veins and very few anomalies were determined for lead and zinc. However, two silver anomalies were determined along the intermediate slope which may reflect subcropping mineralized veins. Induced polarization, self potential, EM 16 and magnetometer tests were conducted over the M vein but no meaningful responses were obtained and further testing was abandoned.

A diamond drilling program was undertaken and a total of 2,050 feet of BQ wireline drilling was completed (Greig, 1975). A 450 foot section along the M vein was tested by holes 1 to 15 and the A vein was tested by holes 16 to 18. The drilling revealed that the M vein (see Figure   ) was structurally erratic along strike and locally pinched out at depth. The single discrete vein appeared to split locally and form a series of parallel quartz veins. The best intersections on the M vein are in holes 2, 3 and 8 where gold values averaged approximately 0.15 oz Au/ton over a 4 foot mining width. In general, the values intersected are erratic and much lower in grade than expected on the basis of surface assays. The three holes drilled along the A vein encountered only one minor intersection with a gold bearing quartz vein.

Placer Claims

Placer potential in the area first recieved attention when it was discovered by M. Kenyon of Claymore Resources that the upper reaches of a nearby southerly flowing creek (Kenyon Creek, formerly called Discovery Creek) contained abundant easy-to-pan coarse gold. Following this discovery, several placer leases were staked by both companies on streams in the area, including Claymore Creek, Great Bear Creek, Kenyon Creek, West Swamp Creek, Scottie Creek and Seven Mile Creek.

Kenyon Creek

Evaluation work has concentrated on Kenyon Creek, where Claymore holds the following placer claims: BUFF 1-9, JUL 1-7, RUPE 1-12, JESS 1-6. In summer 1975, pit samples were obtained along the creek a distance of more than 4,000 feet with none of the samples assaying less than 1/2 oz Au/cubic yard. Later in November and December 1975, a rotary drilling program was conducted on Kenyon Creek (Sinclair *et al*, 1976) and the area of gold bearing gravels was extended. In 1976, 23 large sample trenches were dug with a bulldozer and the exposed sections were sampled. All but one of the trenches were in frozen gravels, the thickness of which was noted to increase substantially downstream, especially below the transition from the upper to the lower slope.

QUARTZ VEIN AND DRILL HOLE LOCATION MAP, MOOSEHORN RANGE

Modified after D Waugh (1975) and J Greig (1975)
Map area shown on geological map of Moosehorn Range

The sampled sections proved to be gold bearing and company geologists recommended sampling by close space drilling of the lower slope portion of the creek.

A pilot plant operation was initiated and conducted on the upper reaches of Kenyon Creek from early June to the end of September, 1976, and twelve thousand cubic yards of gravel was processed. In the operation, gravel was dumped by a front-end loader onto a six inch grizzly mounted above a hopper which fed into two parallel sluice boxes with removable ladder-type riffles (see Plate). A one inch mesh screen was located between the hopper and sluice and oversize material was removed from the screen by waterhose onto a conveyor which then removed it 20 feet from the operation site. A tailings pond was constructed 200 feet below the sluice and a storage dam was built 500 feet upstream. A recycling pump in the tailings pond returned water to the operation.

The placer working area is located at the junction of two intermittent streams which form the headwaters of Kenyon Creek. At this site, the material that is processed consists mainly of alluvially reworked residual gravel and soil derived from a triangular-shaped drainage source area on the west side of the Moosehorn Range, the triangle base extending along the top of the ridge for 6,500 feet. In this area, residual soil directly overlies bedrock and attains thicknesses of several feet to more than 30 feet. Alluvial gravel overlies the residual soil in the creek area but on the slopes between the creeks, a solifluction origin gravel overlies the residual soil.

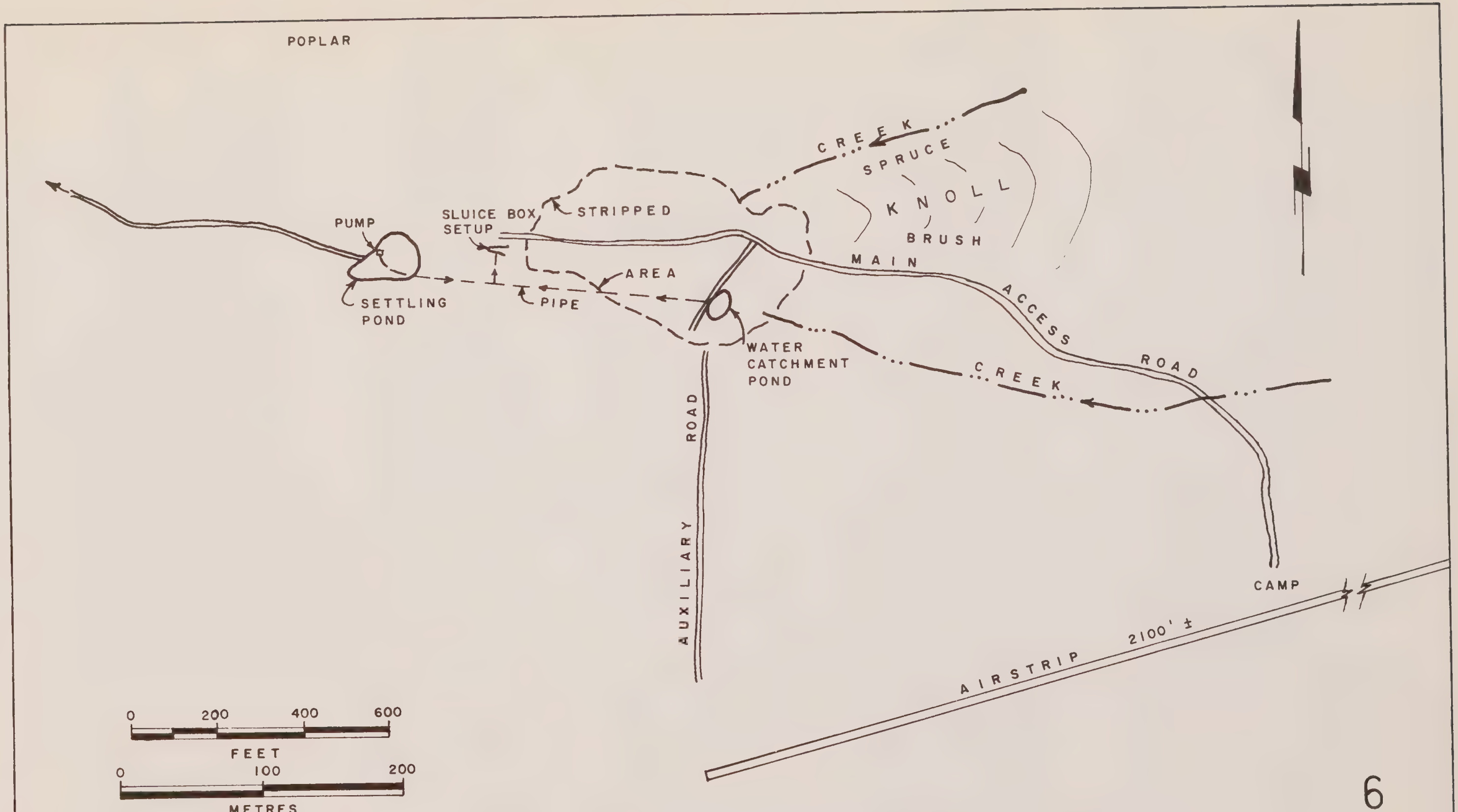
In the pilot plant operation, the top organic soil horizon (1 to 2 feet) was stripped off by bulldozer and piled along the edge of the working area. Material processed through the sluice consisted of grey sandy alluvial gravel (commonly about five feet thick) and the uppermost foot of the underlying residual soil. The residual soil below the creek gravels directly overlies bedrock and attains thicknesses of several feet to more than 30 feet. The recovered gold is porous, frothy looking and greyish in colour with jagged, angular edges and total production in 1976 amounted to 1,895 ounces of raw gold (about 70 per cent pure) and 40 ounces of jewelry gold.

Swamp Creek

Claymore holds the following placer claims on Swamp Creek: RED 1-12, DEER 1-12, SOYA 1-7, BEEF 1,2. In 1976, 5 large trenches were bulldozed on the north fork of Swamp Creek, all in the order of 60 feet by 25 feet by 7 feet deep. The trenched material consisted of unsorted coarse gravel of probable solifluction origin. The recovered gold was both coarse and fine, unsorted and was distributed fairly uniform throughout the section.

Great Bear Creek and Claymore Creek

Claymore holds the following placer claims on these creeks: AUG 1-16, GBM 1-18, RICH 3-86 and FISH 1-5. In 1976, 5 large trenches were bulldozed along Great Bear Creek, commonly about 40 to 50 feet away from the creek. The gravels from both creeks are well rounded and sorted, except in the upper reaches of Great Bear Creek. In the upper portion of Great Bear creek, both unsorted coarse and fine gold with very little settling was recovered. In the lower portion of the creek, the gravel is much thicker and in the top section sampled, only fine gold was recovered. A placer drilling program was recommended by company geologists for both creeks.

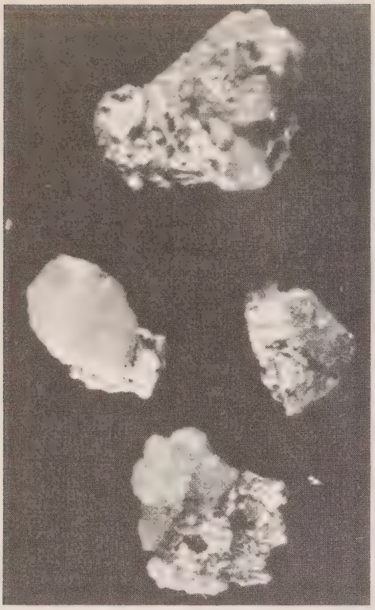


SKETCH OF PLACER WORKINGS ON WEST SIDE OF MOOSEHORN RANGE, LADUE RIVER AREA

J. MORIN 9/1976

Panorama view of working area of pilot plant operation, Kenyon Creek, September 1976. View is looking east up the south fork of headwaters of Kenyon Creek; bulldozer at left centre and sluice box set up in foreground.

7



a

b

c

Placer gold nuggets from Kenyon Creek:

a) equant, rounded, porous gold nuggets with attached quartz grains;

b) nuggets with well developed crystal form;

c) relatively large nugget with attached quartz grains.

(Photomicrographs by J. Payne, Vancouver Petrographics, Vancouver, B.C.)

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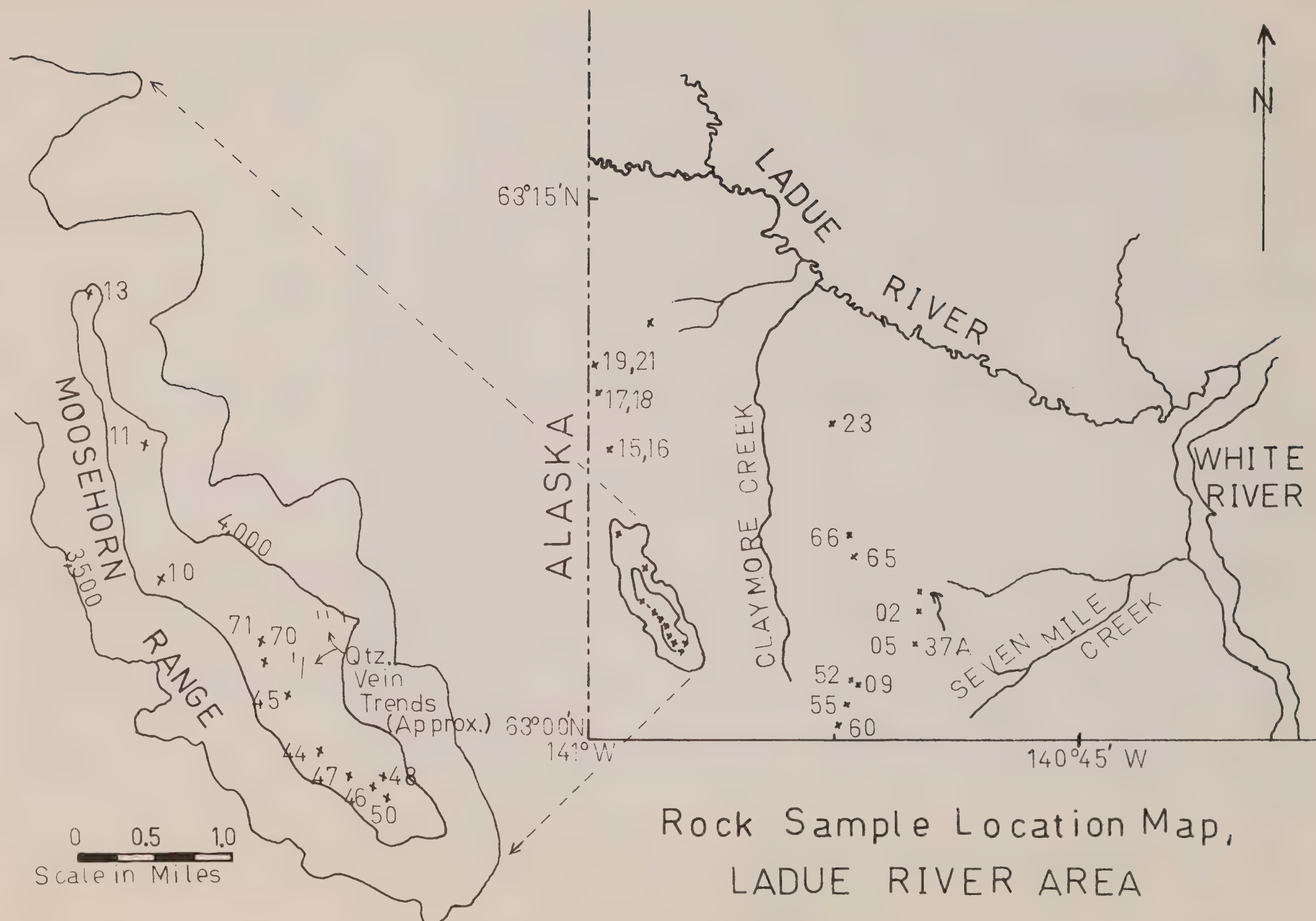

Rock Sample Location Map,
LADUE RIVER AREA

* Sample 041, Lat. 62°42'N, Long. 140°45' W.

9

ACKNOWLEDGMENTS

The author would like to thank both Claymore Resources and Great Bear Mining for the hospitality extended him and for the stimulating discussions held with the representatives of both companies.

APPENDIX

The following Tables comprise lists of rock modes derived by visual estimate from a combination of K-feldspar stained thin sections and rock slabs.

TABLE I.

Metasedimentary Rocks of the Yukon Group in the Ladue River Area

	K-016	K-017	K-018	K-019	K-021	K-037A	K-065
Plagioclase	10	30	50	35	60	45	30
K-feldspar	50	25	20	12	-	-	20
Quartz	35	35	20	45	30	-	35
Biotite	1	9	5	2	8	-	8
Muscovite	3	1	-	2	-	-	Tr
Hornblende	-	-	-	-	-	53	-
Magnetite	Tr	Tr	Tr	2	Tr	Tr	1
Apatite	Tr	Tr	Tr	Tr	Tr	Tr	Tr
Chlorite	Tr	-	Tr	-	Tr	Tr	-
Allanite		Tr	Tr	Tr	Tr	-	-
Epidote	Tr	Tr	Tr	Tr	Tr	Tr	-
Garnet	-	-	-	-	-	-	1
Sphene							

Location and Samples:

K-016, microcline-quartz-plagioclase-muscovite gneiss,
K-017, porphyroblastic microcline-plagioclase-quartz-biotite gneiss,
K-018, plagioclase-microcline-quartz-biotite-muscovite gneiss,
K-019, quartz-plagioclase-microcline-magnetite gneiss, and
K-021, plagioclase-quartz-biotite gneiss, Moosehorn Range;
K-037A, amphibolite, and
K-065, quartz-plagioclase-orthoclase-biotite-garnet gneiss, east of Moosehorn Range

TABLE II

Foliated Granodiorite-Quartz Diorite of Ladue River Area

	K-002	K-011	K-013	K-015	K-023	K-041	K-060	K-066
Plagioclase	60	50	50	75	35	35	50	60
K-feldspar	-	20	15	-	10	-	10	1
Quartz	5	20	25	10	30	35	5	10
Biotite	10	10	8	13	10	10	15	10
Hornblende	25	-	1	-10	20	20	20	20
Muscovite	-	Tr	-	Tr	-	-	-	-
Magnetite	Tr	Tr	1	Tr	1	Tr	Tr	Tr
Apatite	Tr	Tr	Tr	Tr	Tr	Tr	Tr	Tr
Chlorite	Tr	Tr	Tr	Tr	Tr	Tr	-	Tr
Epidote	-	Tr	Tr	Tr	Tr	Tr	-	1
Sphene	Tr	Tr	Tr	2	1	Tr	2	1

TABLE III

Seven Mile Creek Stock

	K-005	K-009	K-052	K-055
Plagioclase	35	35	50	30
K-feldspar	40	40	20	50
Quartz	10	10	10	10
Hornblende	11	10	15	8
Biotite	4	4	5	2
Apatite	Tr	Tr	Tr	Tr
Chlorite	Tr	Tr	Tr	-
Epidote	-	-	Tr	-
Sphene	Tr	1	2	Tr
Magnetite	Tr	Tr	Tr	Tr

TABLE IV

Moosehorn Range Granodiorite

	K-010	K-045	K-048	K-070	K-071A	K-071B
Plagioclase	45	40	50	50	45	55
K-feldspar	10	25	20	10	10	-
Quartz	25	25	20	30	25	5
Biotite	12	5	5	5	10	20
Hornblende	8	1	5	5	10	20
Magnetite	Tr	2	Tr	Tr	Tr	Tr
Apatite	Tr	Tr	Tr	Tr	Tr	Tr
Chlorite	Tr	-	1	Tr	Tr	2
Epidote	Tr	Tr	Tr	Tr	Tr	Tr
Sphene	Tr	-	Tr	Tr	Tr	Tr

TABLE V

Granodiorite-Quartz Diorite Porphyries of Moosehorn Range, Ladue River Area

	K-044	K-046	K-047	K-050
Phenocrysts:	(60)	(50)	(70)	(65)
Plagioclase	35	25	50	25
K-feldspar	-	-	-	3
Quartz	5	20	-	30
Biotite	10	5	10	3
Hornblende	10	1	10	-
Magnetite	Tr	Tr	1	Tr
Apatite	Tr	Tr	Tr	Tr
Sphene	Tr	-	-	-
Allanite	-	-	-	Tr
Matrix:	(40)	(50)	(30)	(35)
Plagioclase	15	15	8	9
K-feldspar	6	20	12	15
Quartz	13	12	4	15
Biotite	6	3	6	3

GEOLOGY OF THE WELLGREEN PROPERTY

by
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INTRODUCTION

The Wellgreen Mine is 3.2 kilometers west of the junction of Quill and Nickel Creeks in the Quill Creek area of the Kluane Ranges (Figure 1). A geologic property map at a scale of 1:4800 (Campbell, 1977) covers an area of 3.8 square kilometers with the mine situated near the eastern border. A 13 kilometer gravel road which joins the Alaska Highway near Km. Post 1778 provides access to the mine site.

The Kluane Ranges have long been noted for numerous nickel-copper sulphide showings associated with mafic and ultramafic rocks. Wellgreen Mine is the only past producer of Ni-Cu in the area.

This report is a progress report on the petrological and structural features of the Quill Creek mafic-ultramafic complex and the mineralography of its associated nickel-copper sulphide deposits. A genetic interpretation of the mineralized complex is outlined.

GEOLOGICAL SETTING

An intensely folded and faulted sequence of Permo-Pennsylvanian, Triassic and Jurassic volcanic and sedimentary rocks, with Cretaceous and Tertiary granitic intrusions, is exposed along the length of the Kluane Ranges (Figure 1). The stratigraphy has been correlated with that found to the northwest in the Taku-Skolai Terrane (Read and Monger, 1976). The Kluane Range part of this Terrane forms a fault-bounded, elongate wedge. Shakwak Fault separates this wedge from granitic and metamorphic rocks of both the Coast Crystalline Complex and Yukon Crystalline Terrane to the east; Duke River Fault marks the western boundary with Alexander Terrane granitic and Paleozoic metamorphic rocks of the the St. Elias Mountains.

Horizontally to doubly plunging, inclined, tight to isoclinal folds trending northwest at 30° to the Shakwak Trench are characteristic of the Kluane Permo-Triassic section. These folds are clearly traceable between White River and Burwash Creek, but are obscured to the south by numerous later dip-slip faults trending subparallel to fold axial traces. These faults commonly follow lithologic contacts. A secondary, younger group of strike-slip faults trend roughly perpendicular to Shakwak Trench. Deformation was accompanied by low grade regional metamorphism.

A 260 square kilometer section of the Kluane Ranges is shown in Figure 1. Major map units within this area include the volcaniclastic rocks of the Lower Permian Station Creek Formation; argillites, shales, and limestones of the Lower Permian Hasen Creek Formation; basaltic flows of the Upper Triassic Nikolai Greenstone; and Permo-Triassic mafic and ultramafic rocks. A lithologic description of the Permo-Triassic section is given in Campbell (1977).

Mafic and ultramafic rocks, intruding the Taku-Skolai Terrane, are most numerous in the Quill Creek area and farther south along the Kluane Ranges. Ultramafites intrude concordantly near the Permian volcanic-sedimentary gradational contact and within the Hasen Creek Formation. Mafic rocks occur in three distinct settings: (1) concordantly along the lower or upper contact of an ultramafite; (2) as concordant bodies near the Permo-Triassic discon-

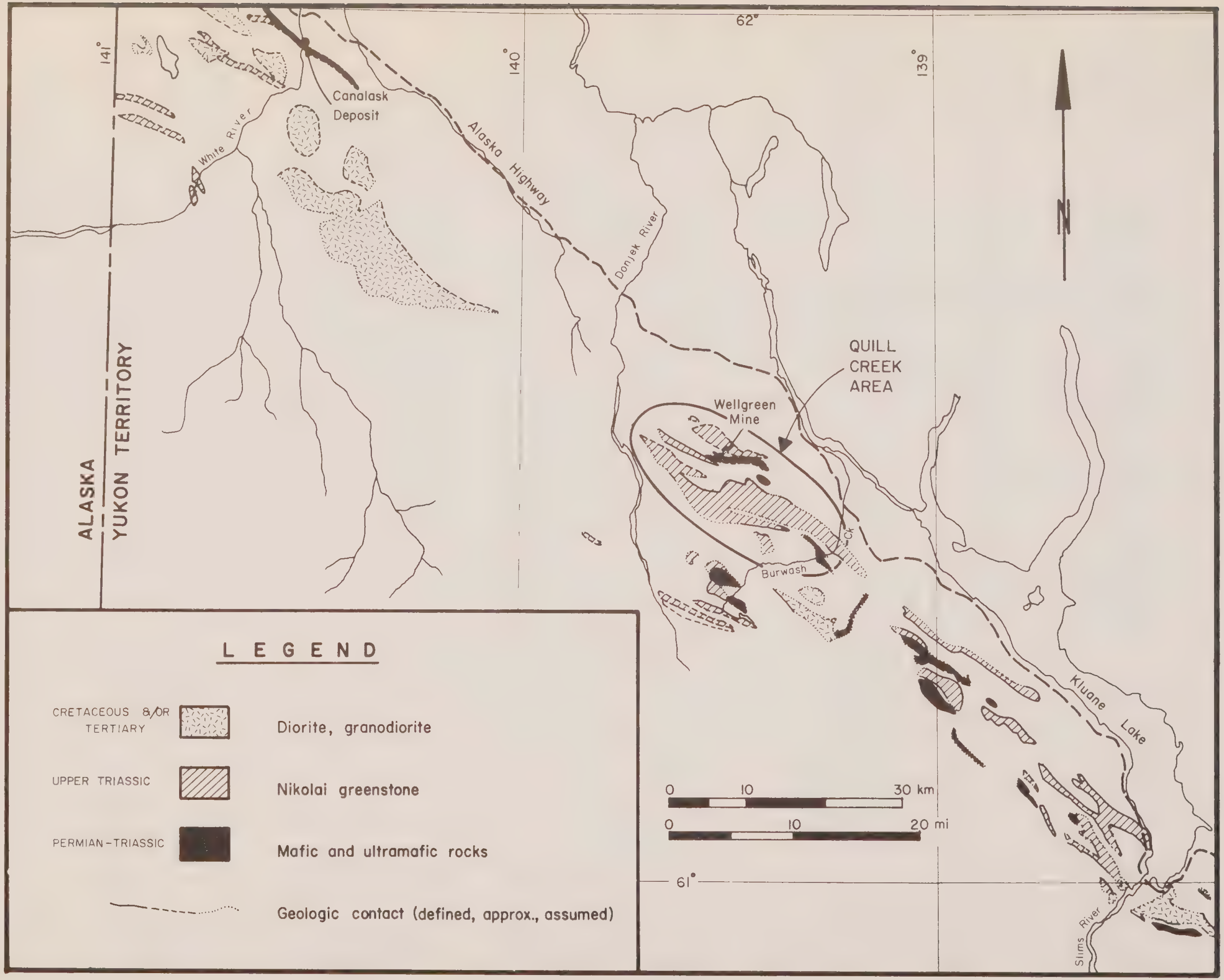

Figure 1. Location map.

formity; and (3) as small discordant bodies within the Nikolai Greenstone. The Quill Creek mafic-ultramafic complex is the largest intrusion of its kind in the area studied, measuring 7.6 kilometers in length and 900 meters in apparent thickness (the latter dimension is believed to be exaggerated by folding and faulting). These mafic and ultramafic bodies are hosts to nickel-copper sulphides.

LOCAL GEOLOGY

General Statement:

The Wellgreen Property lies on the southwest limb of a doubly-plunging, inclined syncline southeast of its point of depression. Attitude of the axial plane is 108°/68° SW and the axes plunge at 30° to the southeast and to the northwest. Lower Permian volcaniclastic rocks (Station Creek Formation) and sedimentary rocks (Hasen Creek Formation), and Upper Triassic amygdaloidal basalts (Nikolai Greenstone) constitute the fold. The area surrounding Wellgreen Mine is centered on the northwestern extremity of the Quill Creek mafic-ultramafic complex (Figure 2). This complex sits approximately 27 meters below the gradational contact between Station Creek andesitic tuffs and Hasen Creek pale to medium grey cherty argillites and shales. The tuffs are interbedded with abundant discontinuous limestone and cherty and shaly argillite near the contact. Primary bedding planes have a variable strike of 070° to 120° and a dip of 50° SE through 90° to 50° SW. The foliation is 105°/60° to 70° SW. The Quill Creek complex parallels the stratigraphy and separates into three subparallel fingers (as a result of folding and shearing) at its northwestern extremity. Basal section of the sill is in fault contact with Nikolai volcanic flows to the southwest. Numerous small felsic dykes crosscut the mafic-ultramafic complex and surrounding country rocks. These dykes are noticeably absent in other mafic and ultramafic bodies.

Quill Creek Complex:

Petrology:

The ultramafic part of the complex is intensely sheared, highly altered, medium-grained, and pale to dark green and greenish-black. Layering is apparent with a 190-meter basal section of dunite topped by 610 meters of peridotite grading upward from harzburgite to werhlite.

Dunite is pale to medium-green on the weathered surface and forms very rubbly outcrops surrounded by talus. Fresh surfaces of dunite are dark greenish-black and show no obvious textural features, whereas weathering brings out the well developed cumulate texture, which may or may not be sheared parallel to layering. Dunite is composed of 95 per cent (by volume) olivine, which occurs as idiomorphic crystals 1 to 2 mm across.

The peridotite secton of the sill is dark green to greenish-black and forms severely sheared outcrops that are commonly reduced to a slippery talus. Textures are best seen in thin section and vary with vertical position in the peridotite. Harzburgite at the base shows cumulate idiomorphic olivine crystals from 1 to 1.5 mm across with intercumulus xenomorphic orthopyroxene from 0.5 to 1 mm across. Lherzolite has a poorly developed cumulate texture with interstitial to intergranular orthopyroxene and poikilitic clinopyroxene plates containing olivine. The top of the peridotite section contains werhlite with a massive, fine-grained crystalline texture showing poikilitic clinopyroxene in detail. The orthopyroxene is believed to be enstatite, although identification is difficult due to extensive alteration. Diallage is the allotriomorphic clinopyroxene measuring 1.5 to 3.0 mm across. Poikilitic to

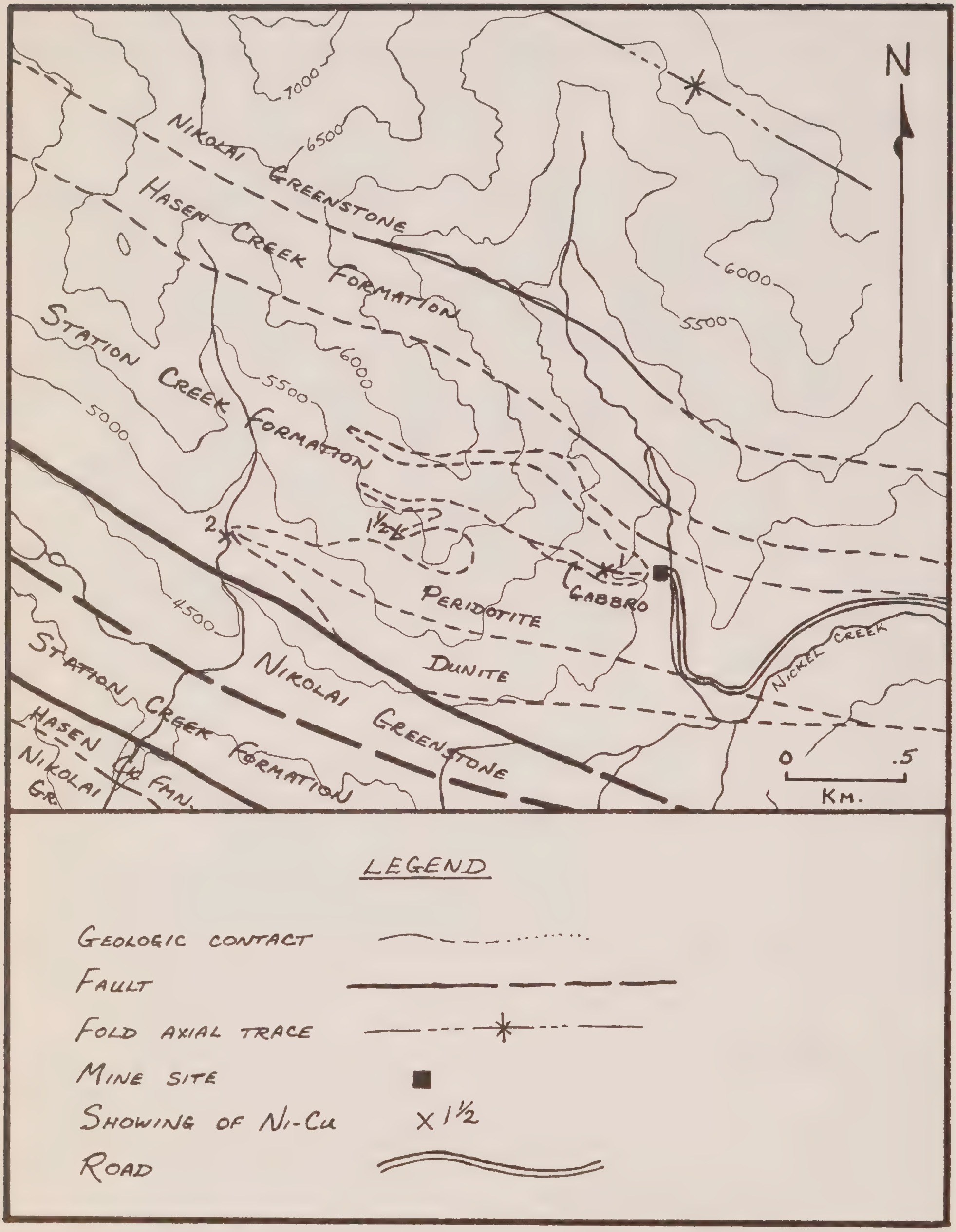

Figure 2. Geologic sketch of the Wellgreen Property and immediate surroundings.

intergranular pale brown phlogopitic biotite accounts for an average of 1 per cent by volume. Interstitial pyrrhotite-chalcopyrite grains are present in small amounts throughout the peridotite and will be discussed later.

Mafic parts of the Quill Creek complex are limited to only a few surface outcrops. Weathered surfaces are greenish-grey to brown, whereas fresh surfaces are dark green. The dominant texture is massive allotriomorphic granular. Poikilitic clinopyroxene contains scattered idiomorphic plagioclase laths. Orthopyroxene is present in amounts up to 15 volume per cent. Diallage, measuring 1.5 to 2.5 mm across, is the clinopyroxene and it represents 40 to 60 per cent by volume of the gabbro. Composition of the plagioclase ranges from An_{50} to An_{70}. Plagioclase crystals are typically twinned and commonly show zoning from an andesine rim to a bytownite core. Accessory minerals include minor intergranular quartz and biotite. Interstitial pyrrhotite and chalcopyrite account for 5 to 25 per cent of the rock in surface showings. Underground gabbro samples contain net texture sulphides amounting to more than 30 per cent by volume.

Alteration:

Both the mafic and ultramafic parts of the Quill Creek complex have been extensively altered. More than 95 per cent of the dunite layer has been serpentinized. Antigorite, magnetite, and traces of talc are pseudomorphic after olivine with magnetite outlining the original olivine crystal shape and antigorite occurring both in the center and as a 'skirt' around the magnetite rims. All original olivine has been serpentinized. Fifty to 100 per cent of the interstitial to intergranular orthopyroxene is altered to antigorite ± chlorite. Diallage is up to 50 per cent altered to uralite and chlorite. Biotite displays slight alteration to chlorite. Sulphide minerals are partially rimmed by magnetite. Magnetite grains are scattered throughout the ultramafic rocks as a result of serpentinization. Slip-fibre chrysotile veins ± chlorite commonly run along olivine grain boundaries subparallel to cumulate layering and may or may not show continuity. Some serpentine stringers crosscut olivine pseudomorphs, pyroxene, and sulphide mineral grains. Magnetite veinlets are also found in peridotite samples. One thin section shows pyrrhotite grains associated with carbonate in chrysotile veinlets. Most fractures and shears are filled with alteration stringers. Extensively altered peridotite has very apparent alternating layers of magnetite and silicates. Gabbro intruding the peridotite has been subjected to severe alteration. Orthopyroxene is completely altered to chlorite and epidote. Fifteen per cent and rarely as much as 50 per cent of the clinopyroxene content is altered to chlorite ± uralite ± carbonate. Minor amounts of epidote may be associated with this assemblage. Sericite and more commonly saussurite are formed at the expense of most of the plagioclase. Sulphide grains are rimmed by magnetite and in one particular thin section show rims of carbonate + quartz ± talc.

A pattern to the serpentinization and alteration of the gabbro, either lengthwise along the complex or vertically, is not apparent.

Structure:

Contact features of the Quill Creek complex are not well exposed. Outcrops of the complex and of the surrounding country rocks are most often separated by talus. Edges of ultramafic outcrops show serpentine-covered shear surfaces with one or more sets of slickensides. Only one location defines a sharp intrusive contact between peridotite and bleached massive andesitic tuff. The contact strikes 109° and dips 53° to the southwest. Although intrusive contacts of ultramafite into Permian country rocks are rare

on the Wellgreen Property, they are found where the Quill Creek complex crosses Linda Creek and elsewhere in the study area. Contacts between gabbro and peridotite are sharp with the former intrusive into the latter. Xenoliths of peridotite are typical and penetrate 0.5 meters into the gabbro body. Contacts between gabbro and country rock are uncertain. A striking feature of the Permian tuffs and argillites on the Wellgreen Property is an irregular cream-white zone of alteration up to 60 meters wide at the contact with peridotite. The alteration is carbonatization and its intensity decreases away from the ultramafite.

Internally the complex is intensely sheared. Five main shear directions characterize the northwest end of the Quill Creek complex: (1) 085°/80° NW to 80° SE; (2) 114°/80° SW to 60° NE; (3) 075°/64° SE; (4) 152°/70° SW; and (5) 073°/26° SE. Most shear surfaces show two or more sets of slickensides, but the dominant lineations are: (1) 47°/280°; (2) 07°/229°; and (3) 12°/ 183° - that is, essentially in the southwest quadrant. On a microscopic scale minute shears are accompanied by mortar texture and shearing is commonly parallel to cumulate layering.

Nickel-Copper Sulphide Deposits:

Types of Occurrence:

Wellgreen Property has three surface showings of nickel-copper sulphide minerals; going from southeast to northwest they are the No. 1, 1 1/2 and 2 Showings. Types of sulphide mineral occurrence include:

(1) Massive, fine-grained sulphides with or without abundant magnetite	No. 1
(2) Breccia sulphides with inclusions of tuff, argillite, gabbro and peridotite	No. 1
(3) Net texture sulphides in gabbro	No. 1, 2
(4) Heavily disseminated sulphides in gabbro	No. 1, 1½, 2
(5) Weakly disseminated sulphides in peridotite	No. 1, 1½, 2
(6) Disseminated and stringer sulphides in cherty argillite and altered tuff	No. 1, 1½

The massive pods of nickel-copper are 3 to 18 meters in width with sharp contacts and sit at the gabbro/country rock contact. They pinch and swell along the contact, forming ribs that plunge to the west (Vincent, 1972). A black border zone is present in gabbro at the massive sulphide/gabbro contact (Eckstrand, written communication). A thin section shows this zone to be a pyroxene hornfels. Maximum grades in the massive sulphide pods are 6 per cent Ni and 2 to 3 per cent Cu. These grades yield Cu/(Cu + Ni) values of 0.3 for massive ore and 0.6 for disseminated ore in gabbro.

Mineralography:

Sulphide minerals in the Wellgreen deposits include (in relative order of abundance): pyrrhotite, pentlandite and chalcopyrite. Pyrite is absent. Pyrrhotite forms 50 to 90 per cent of the total sulphide content, pentlandite averages 10 to 25 per cent, and chalcopyrite ranges from 15 to 30 per cent.

Pyrrhotite is allotriomorphic granular and forms irregularly shaped masses. Pentlandite occurs as feathery exsolution flames in pyrrhotite masses, as xenomorphic patches between pyrrhotite grains (rim texture), as small regularly shaped grains scattered along pyrrhotite grain boundaries (also rim texture), and as coarse, well defined grains showing octahedral cleavage. Chalcopyrite occurs as small irregularly shaped blebs in pyrrhotite masses (usually at grain boundaries), as patches along the boundary between pyrrhotite and silicates, and as tongues and scattered masses along fractures within the silicates.

Certain textures of the sulphide minerals are indicative of a magmatic origin as an immiscible sulphide melt. Pyrrhotite-chalcopyrite patches are intercumulus to olivine crystals in peridotite. They also occur with olivine in poikilitic clinopyroxene. Small oval-shaped blebs of sulphides sit along the cleavage traces in clinopyroxene. Olivine crystals and other silicate grains are incorporated into masses of pyrrhotite. Net texture sulphides in gabbro are also indicative of a magmatic origin.

Numerous textures of the different types of sulphide occurrence show deformation and/or remobilization. Foliation of the sulphide masses is slight to well developed. This foliation may be due to alternating bands of pyrrhotite-pentlandite and chalcopyrite-silicates. The silicate inclusions are scattered into aggregates of rounded particles that are strung out and aligned subparallel to each other. These silicate aggregates are often augen-shaped and boudinaged with foliated sulphide minerals wrapping around them. Locally the aggregates are rolled. Some polished sections show the silicates to be strung out, folded, sheared, broken and rolled. Most silicate inclusions are mottled around their borders. Chalcopyrite intrudes silicate masses as veinlets, stringers and irregular patches along fractures. These veinlets start in the pyrrhotite mass and crosscut both it and the silicates. Pyrrhotite forms its own veins although they are not as common as those of chalcopyrite. Chalcopyrite and pyrrhotite rarely occur together in the same veinlet. These stringers are generally perpendicular to foliation and may or may not contain wisps of serpentine and chlorite arranged parallel to the veinlet walls. One polished section shows a tension gash of serpentine and chlorite with accompanying sulphide grains.

Effects of Alteration:

The serpentinization process and combined chloritization and carbonatization have affected textures of the sulphides in peridotites and gabbros, respectively. Magnetite partially surrounds some sulphide grains. Serpentine stringers crosscut sulphide minerals as well as the silicates. Disseminated sulphide masses have ragged, embayed edges with smaller bits of sulphide around the main mass. Alteration halos of magnetite zoning outward through carbonate ± chlorite to quartz are common in heavily disseminated gabbro sulphides. Halos of talc and minor epidote are less common. Some polished sections show needles or blades of serpentine interfingering with sulphide masses along their borders. These sulphide patches may be reduced to concentrated aggregates of serpentine and sulphide blades.

Structure:

Structural relationships are important in determining positions of the massive sulphide bodies and their genetic link to the mafic-ultramafic complex. Available underground information for the Wellgreen Property is limited. The massive sulphide body exposed at No. 1 Showing has sharp contacts with footwall cherty argillite and hangingwall gabbro. The sulphide/cherty argillite contact is roughly parallel to bedding and chalcopyrite veins and string-

ers penetrate the sedimentary rock along fractures both mega- and microscopically. The sulphide/country rock contact is locally a fault (Vincent, 1972). Contact between gabbro and massive sulphide pods is a fault at the surface and is evidently faulted underground (R. Cherlet, pers. comm., 1975). The massive sulphide bodies pinch and swell in complementary fashion relative to the gabbro (D.P. Price, company report). Price suggests the ore contacts are most commonly defined by faults and joints striking northwest and dipping subparallel to the gabbro. Slickensides plunge at a low to moderate angle to the west. The most significant ore zones occur as erratic, discontinuous pods that pinch and swell, forming west to northwest plunging rolls. Overall dip of the gabbro/cherty argillite contact is 60° to 65°SW with local abrupt changes where step-like features create flat spots (Vincent, 1972). Figure 3 illustrates the underground structural setting of the massive sulphide bodies as interpreted from available information and modified after Vincent (1972).

GENETIC INTERPRETATION

General Statement:

Three broad areas of the Yukon Territory are characterized by mafic to ultramafic rocks. Both Shakwak and Tintina Faults have spatially associated mafic and ultramafic bodies scattered along their lengths. A third area is southeast and east of Whitehorse - the northern extension of the Cassiar ultramafic belt of British Columbia. Nickel-copper sulphide showings in the Yukon appear to be restricted to the Kluane Range mafic and ultramafic rocks along the southwest side of the Shakwak Trench between Slims River and White River.

The Quill Creek complex and its associated nickel-copper sulphide deposits is a good example with which to consider genesis because of: (1) large size of the layered complex; (2) completeness of the layered cross section; (3) occurrence of the largest Ni-Cu deposits known in the area; (4) availability of some underground information; and (5) ease of access. Difficulties do exist that obscure the genesis, such as extensive serpentinization and deformation (folding, shearing and major faulting).

Origin of the Quill Creek Complex:

Mafic and ultramafic rocks have been classified according to various parameters. Naldrett (1973) groups these rocks in terms of tectonic setting. The late magmatic history of such complexes is used by Thayer (1971) to delineate authigenic, polygenic and allogenic bodies. Wyllie's (1969) classification of mafic and ultramafic rocks is based on field associations and tectonic environment.

The Quill Creek complex and other mafic-ultramafic rocks along the Kluane Ranges are believed to be differentiated sills, possibly an early phase (Late Permian or Early Triassic) of an extensive period of Late Triassic magmatism that gave rise to the Nikolai Greenstone.

Major features of the Quill Creek body include:

(1) Elongate shape generally concordant to enclosing Permian strata.

(2) Fingering of the complex at both extremities, suggesting folding and faulting along with Permian strata.

(3) Locally unfaulted contacts that are sharp with stringers of ultramafite extending into the country rocks.

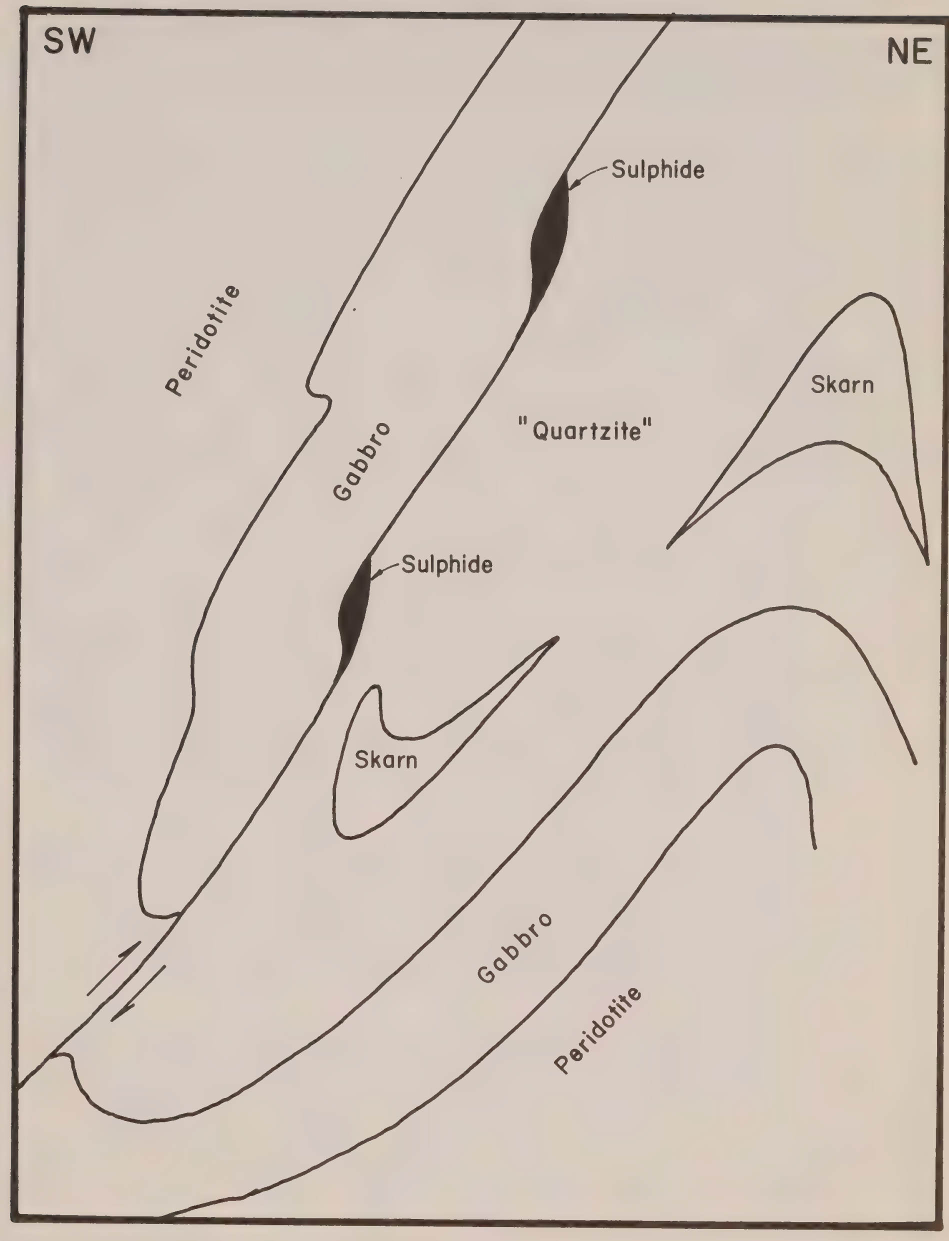

Figure 3. Schematic interpretation of the cross-sectional structural setting of the massive Ni-Cu 'pods'.

(4) Rock types within the complex are layered parallel to contacts and stratigraphy and include a basal section of dunite overlain by a thicker section of peridotite.

(5) Gabbro is elongate and parallel to the ultramafic portion and is at least locally intrusive along the upper contact of peridotite.

(6) Cumulate texture is dominant in dunite and in the lower portion of the peridotite section.

These features are suggestive of a differentiated sill.

Besides sills and lenses other documented types of mafic-ultramafic bodies occuring in orogenic belts are classed as alpine and Alaskan zones. Irvine and Findlay (1972) list characteristics of alpine ultramafites. Some of these criteria are met by the Quill Creek body, such as: (1) mode of occurrence: (2) inconspicuous contact metamorphism; and (3) primary minerals - olivine, orthopyroxene and clinopyroxene. However, (1) remnant sharp intrusive contacts; (2) lack of tectonic layering; (3) absence of chromite; and (4) presence of intercumulus nickel-copper sulphides separates the Quill Creek complex from the alpine category. Features of Alaskan type ultramafites are well documented by Irvine (1974) and Ruckmick and Noble (1959). The lack of outward concentric zoning of rock types from an inner core of dunite automatically precludes the Quill Creek complex from the Alaskan category.

Spatial relationship between the Quill Creek ultramafite (and other ultramafites in the area), gabbros, and Upper Triassic basaltic flows, suggests the possibility of a temporal and genetic relationship. Gabbroic rocks are associated spatially with the ultramafites and also occur within the volcanics. Petrographic comparison between the Quill Creek gabbro and discordant gabbros in the basalt flows shows an increase in modal per cent plagioclase, decrease in per cent clinopyroxene, lower An content of plagioclase, and extreme decrease in per cent interstitial sulphides for the discordant gabbros in Triassic volcanic rocks. Gabbros in the Nikolai sequence are also magnetite-bearing and are fresher and have a coarser-grained equivalent of diabasic texture, compared to the highly altered, allotriomorphic granular Quill Creek gabbro.

It is suggested that prior to Upper Triassic volcanism the Quill Creek complex was emplaced as a crystal mush that differentiated in situ. Olivine is the only cumulus mineral in the Quill Creek body; pyroxenes are poikilitic; sulphides, minor biotite and hornblende are intercumulus. Wager and Brown (1967) suggest that crystal accumulation plays a minor role in differentiation of a sill and that it is confined to early stages of crystallization involving olivine.

An alternative hypothesis to differentiation as a sill is to consider the Quill Creek and other complexes as remnants of the original magma chamber, which have been faulted into their present positions. Many contacts of the Quill Creek body are sheared or faulted and this suggests some degree of movement during the major deformational period. However, the absence of rhythmic layering and igneous lamination (both features essential characteristics of layered intrusions) rules out this possibility.

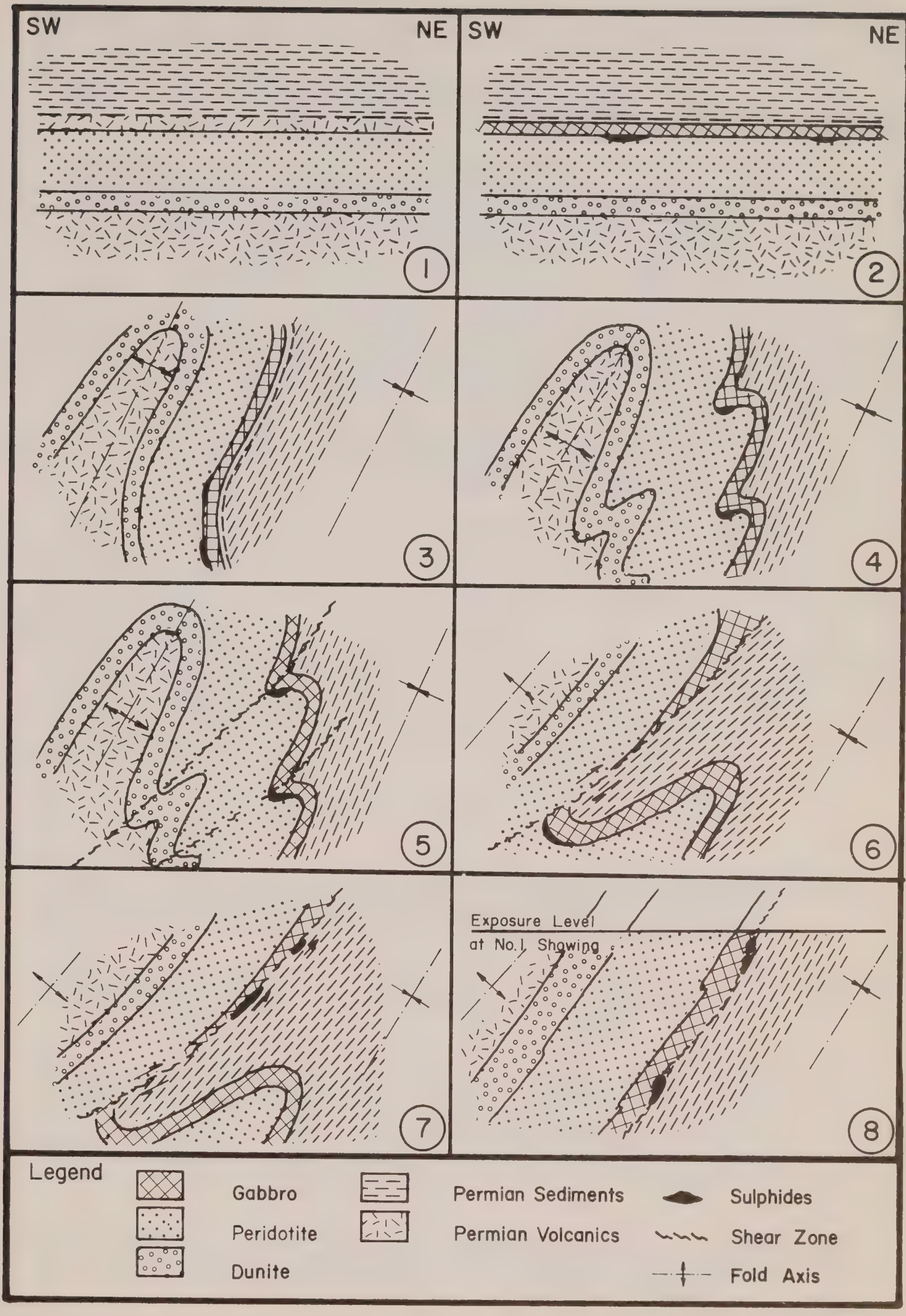

Figure 4. Schematic diagram of interpreted genetic sequence for the Quill Creek complex and Ni-Cu deposits.

Origin of Nickel-Copper Sulphides:

Genesis of nickel-copper sulphides associated with mafic and ultramafic rocks has long been a prominent topic. Naldrett and Cabri (1976), Naldrett (1973), and Naldrett and Gasparrini (1971) discuss and classify various types of nickel-copper sulphide occurrences. Kilburn et al (1969) and Wilson et al (1969) outline the major features and geochemistry of some Canadian nickel sulphide ores.

Small sulphide blebs in silicate grains in both peridotite and gabbro, intercumulus nature of disseminated pyrrhotite-chalcopyrite in peridotite, and interstitial to net texture sulphide minerals in gabbro of the Quill Creek body suggest that these sulphides are primary and represent solidified trapped immiscible sulphide liquid. Genesis of the massive nickel-copper sulphide pods is less easily delineated. These pods are faulted into their present positions, such that they sit stratigraphically above the gabbro. Available underground information and surface examination show a poorly developed trend going from net texture sulphides near the gabbro/peridotite contact to heavily disseminated sulphides away from this contact. This suggests, in accordance with the 'billiard ball' model (Naldrett, 1973), that the massive sulphide bodies were originally located at the base of the gabbro. Figure 4 is a schematic diagram suggesting how the sulphide bodies may have been remobilized and transported to their present positions.

It is suggested that the massive nickel-copper pods at Wellgreen Mine were formed as a result of separation and subsequent sinking of an immiscible sulphide liquid. Factors favoring separation of such a melt (Haughton et al, 1974) existed at an intermediate stage of crystallization of the differentiating Quill Creek sill. This intermediate stage would represent post crystal accumulation of the ultramafic section and before the intrusion and crystallization of the sulphide-rich gabbro. Cu/(Cu + Ni) ratios of greater than or equal to 0.3 and Ni/Cu ratios of less than or equal to 3 for the massive sulphide pods suggest genetic relationship to the mafic rather than ultramafic sections of the Quill Creek complex (Naldrett, 1973; MacLean and Shimazaki, 1976).

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GEOLOGY AND MINERAL DEPOSITS OF THE MINTO AREA, YUKON TERRITORY

by

W.D. Sinclair

INTRODUCTION

The area covered in this report is approximately 120 square miles (300 square km) centered at latitude 62°38'N, and longitude 137°11'W (Figure 1). The centre of the area is two miles (3.2 km) southwest of the Yukon River, 9.5 miles (15.5 km) west-northwest of the abandoned station of Minto and 48 miles (78 km) north-northwest of Carmacks. Access to the area is by boat along the Yukon River or by helicopter from Minto or Carmacks. A tote trail constructed in 1974 from Carmacks is currently suitable for winter travel only.

In 1973 a significant copper deposit was discovered 12 miles (19.2 km) west of Minto. This report summarizes the results of six weeks of field work carried out in 1974 and 1975 to investigate the nature and distribution of the copper deposits in the area. The deposits are similar to the Williams Creek deposit, a brief description of which is included.

HISTORY AND PREVIOUS WORK

The Minto area is part of the Carmacks sheet which was mapped by Bostock (1936) and recently revised by Tempelman-Kluit (1974a).

Prospecting in the area began in the early 1900's following the rush to the Klondike gold fields. The earliest recorded activity was the discovery of a copper showing which was staked as the HARDLUCK claims in 1902 (currently covered by the COIN claims). From then on until the 1970's, little work appears to have been done in the area. In the early 1970's interest in the area was stimulated by the discovery of the Casino copper-molybdenum deposit to the west in 1969 and the Williams Creek copper deposit to the south in 1970. Silver Standard Mines Limited, in a joint venture agreement with American Smelting and Refining Company (ASARCO), encountered anomalously high copper in a stream sediment sample in the area in 1970 and, after subsequent prospecting, staked the MINTO claims in 1971. Shortly after the MINTO claims were staked, United Keno Hill Mines Limited discovered malachite-stained outcrops of granodiorite to the north of the MINTO group and staked the DEF claims under an exploration agreement which included Falconbridge Nickel Mines Limited and Canadian Superior Exploration Limited as partners. In 1971 and 1972 Silver Standard outlined several zones of low grade copper on the MINTO claims (Craig and Milner, 1975). The main mineralized zone of the Minto deposit, which straddles the boundary between the MINTO and DEF claim groups, was discovered by United Keno in 1973 (Sinclair and Gilbert, 1975).

PHYSIOGRAPHY

The Minto area is part of the Dawson Range, which lies within the Klondike Plateau, an old uplifted erosion surface dissected by narrow valleys (Bostock, 1966a). The topography is gently rolling with relief up to 2,000 feet (600 m).

The Klondike Plateau is characterized by a general lack of glaciation. Reid glaciation probably advanced no further than the southwest side of the Yukon River in the Minto area (Bostock 1966b). Isolated gravel terraces in the western part of the Minto area are considered by Bostock (1966b) to be part of the Klaza advance.

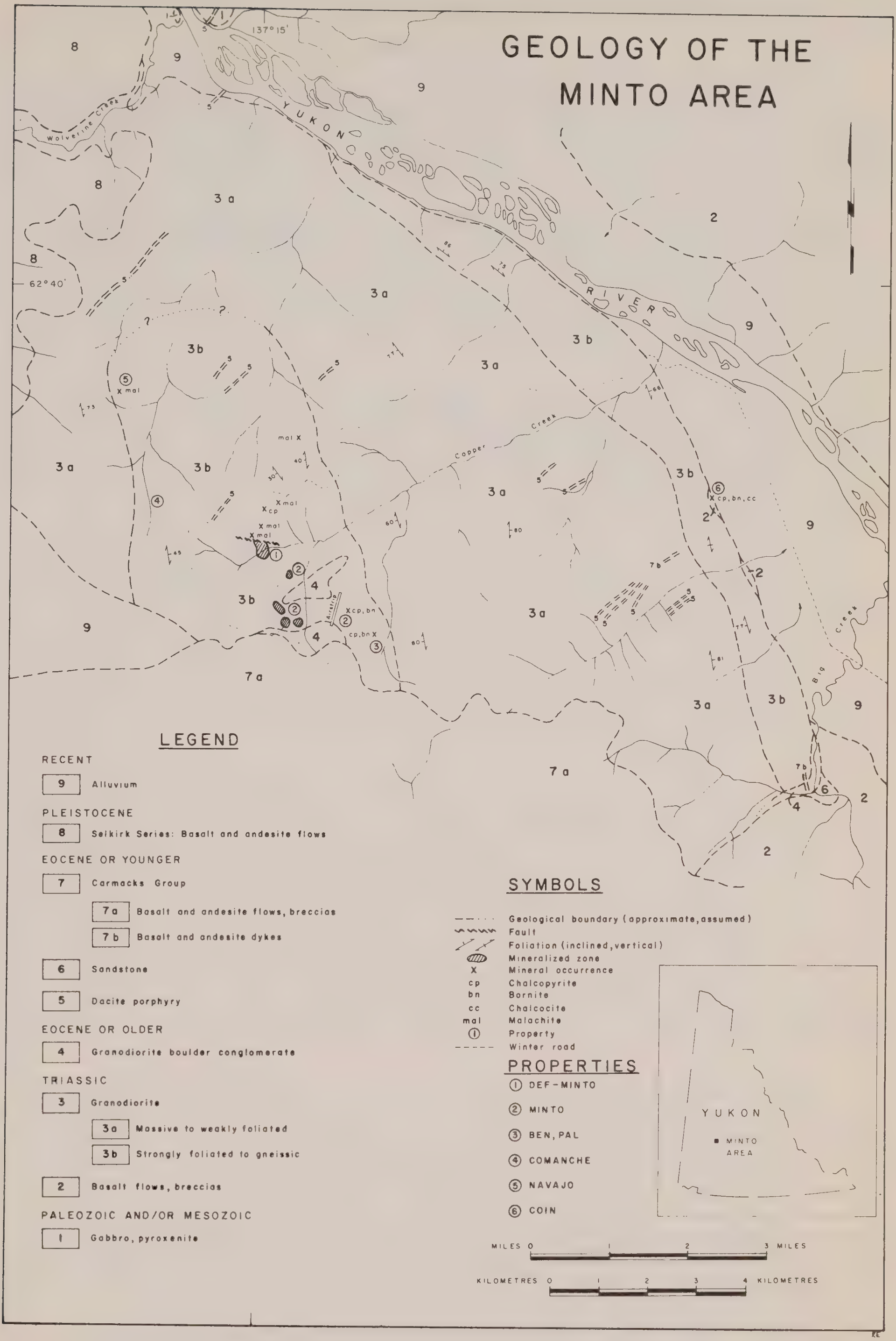

Figure 1. General geology of the Minto area.

Due to the lack of glaciation, bedrock exposure is poor and generally limited to the tops of ridges where it forms blocky, castellated outcrops.

GENERAL GEOLOGY

The Minto area lies within the Yukon Crystalline Terrane. It is underlain mainly by Mesozoic plutonic rocks which have been intruded and overlain by Tertiary volcanic rocks. The general geology of the area is shown in Figure 1.

Gabbro and pyroxenite (Unit 1) occur in a small stock exposed on both sides of the Yukon River at the northern edge of the Minto area. The rocks are dark green, coarse-grained and consist mainly of chloritized hornblende and pyroxene. Altered feldspar is a minor constituent and disseminated magnetite is abundant locally. The gabbro and pyroxenite appear similar to gabbro in the southwest Snag map-area described by Tempelman-Kluit (1974b) and assigned a late Paleozoic age.

The eastern part of the area is underlain by volcanic rocks, mainly massive basalt flows, flow-breccias and tuffs (Unit 2). These rocks are typically dark green and highly epidotized. The contact with granodiorite is steeply dipping and probably a fault. The age of these volcanics is uncertain, but Tempelman-Kluit (1974b) has tentatively assigned similar rocks in the Aishihik Lake map-area a Triassic age.

A large part of the Minto area is underlain by granodiorite of the Klotassin Batholith (Unit 3a) which occurs extensively in the Snag map-area to the west (Tempelman-Kluit, 1974b). The granodiorite is medium- to coarse-grained, massive to weakly foliated and varies from equigranular to porphyritic. Strongly foliated to gneissic zones of similar composition (Unit 3b) occur within massive granodiorite in the west-central part of the area and along the eastern contact with Triassic volcanics. Aplitic and pegmatitic phases of the granodiorite occur as west- to northwest-trending dykes ranging from a few centimetres up to one metre across.

Modal analyses of the granodiorite indicate a compositional range from quartz diorite to quartz monzonite (Figure 2). Oligoclase (An_{24-27}) is the main constituent and makes up 40 to 65 per cent of the rock. Quartz content varies from 10 to 25 per cent and potash feldspar content from 5 to 20 per cent. In the porphyritic granodiorite, potash feldspar occurs as pink orthoclase phenocrysts up to 2 cm long. Mafic minerals, mainly biotite with varying amounts of hornblende and epidote, constitute 5 to 15 per cent of the rock. Hornblende occurs as stubby, subhedral crystals commonly replaced by biotite and epidote. Sphene, apatite and zircon are common accessories; allanite is rare. The granodiorite is usually fresh except for surficial weathering and local sericitization of plagioclase which gives the rock a greenish cast.

Foliated zones in the Klotassin granodiorite (Unit 3b) are caused by the alignment of mafics, particularly biotite. A subtle tendency of orthoclase phenocrysts to be aligned with the foliation occurs locally. The degree of foliation varies from weak foliation characterized by subparallel recrystallization of biotite to strong foliation marked by strong alignment of the mafics and gneissic, compositional banding. The strongly foliated zones are generally similar to the massive granodiorite in modal composition (Unit 2) although high concentrations of mafics, mainly biotite, occur locally. There are also siliceous sections with a very low mafic content. Almandine* common-

*Identified by X-Ray Diffraction Laboratory, Geological Survey of Canada

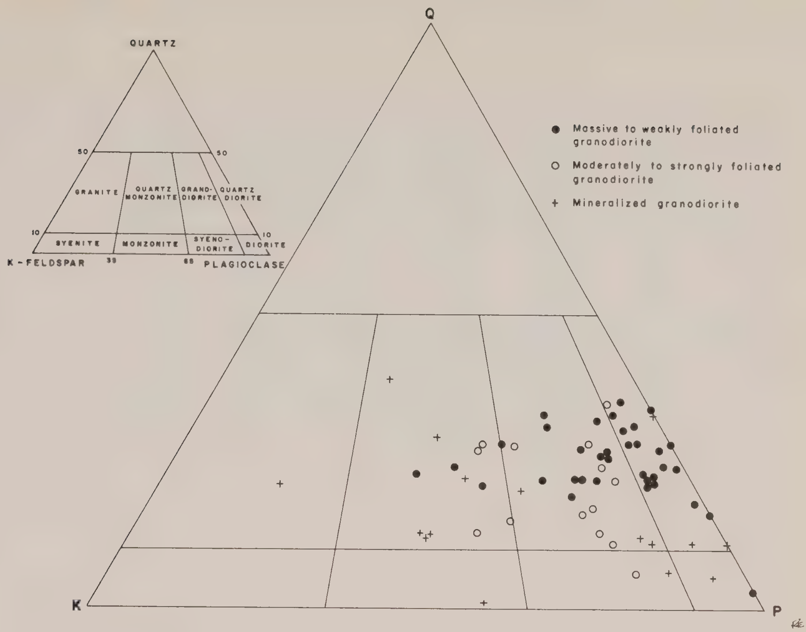

Figure 2. Modal analyses of granodiorites from the Minto area.

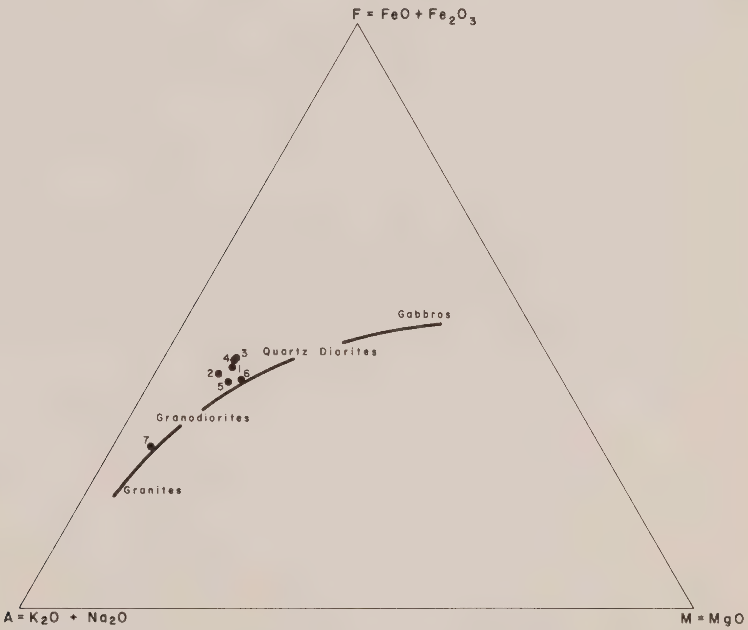

Figure 3. AFM plot of igneous rocks from the Minto area. Numbers refer to samples from Table 1. Solid line represents AFM plot of typical rocks, Lower California batholith (after Larsen, 1948 in Carmichael et al, 1974, p. 568).

ly occurs in strongly foliated, biotite-rich zones. Magnetite is common, occurring as disseminated grains and in bands up to 2 cm wide. Ilmenite is associated with magnetite locally.

The strongly foliated zones occur mainly in the west-central part of the area in a belt approximately 4 km wide trending slightly west of north (Figure 1). The nature of the foliated zones within the belt has been observed mainly from diamond drill core. Zones of strong foliation vary from less than 1 m up to 60 m wide. Contacts with massive or weakly foliated granodiorite are often gradational although sharp contacts have been observed in places. The zones are discontinuous laterally and interfinger with massive to weakly foliated granodiorite.

Foliated zones in the belt trend approximately 330° and define a broadly synclinal structure. On a gross scale, foliation dips are flat-lying to gently-dipping along a central axis and gradually steepen, dipping 60° to 70° towards the axis along the margins of the belt. In detail, the structure appears to be much more complex as foliation angles in drill core from the central part of the belt vary from 0° to 90° over relatively short intervals and isoclinally folded foliation occurs locally. Analysis of poles to the foliation indicates the synclinal structure plunges 10° to the northwest, where the foliated zones interfinger with or grade into massive granodiorite. To the southeast, the foliated zones are covered by Carmacks Group volcanics.

An area of strongly foliated granodiorite lacking gneissic or compositional banding occurs along the eastern margin of the granodiorite (Figure 1). The foliation in this area is steeply-dipping and is characterized by cataclastic features such as streaking of the mafics and straining and fracturing of quartz grains, probably related to differential movement between the granodiorite and the Triassic volcanics to the east.

Chemical analyses for six samples of different phases of the granodiorite are given in Table 1. The analyses are remarkably similar except for sample 5 which is lower in SiO_2 and higher in CaO. The chemical similarity of the different phases is also reflected in the AFM diagram shown in Figure 3. All the samples have typical values for granodiorite to quartz diorite.

The age of the granodiorite is probably Late Triassic. A single determination on biotite from foliated biotite granodiorite in the Minto area yielded a K-Ar age of 174 million years but this is thought to be the result of a thermal event superimposed on the granodiorite 160-170 million years ago (Tempelman-Kluit and Wanless, 1975). Determinations from similar rocks elsewhere in the Dawson Range have yielded ages up to 223 million years (Tempelman-Kluit and Wanless, 1975).

Table 1. CHEMICAL ANALYSES OF GRANITIC ROCKS, MINTO AREA[1]

Sample*	1	2	3	4	5	6	7
SiO_2	64.60	65.90	65.50	64.50	58.60	65.00	69.30
Al_2O_3	17.30	16.00	16.80	16.50	16.80	16.70	15.70
Fe_2O_3	2.54	2.64	1.80	2.06	3.93	0.61	1.14
FeO	2.79	2.70	3.65	4.19	2.51	4.34	1.80
MgO	1.40	1.30	1.39	1.58	1.93	1.67	0.60
CaO	4.50	4.30	3.80	2.85	6.00	3.10	3.20
Na_2O	4.40	3.60	4.00	3.10	4.20	3.70	4.40
K_2O	1.75	3.10	2.00	3.75	4.00	2.35	2.65
TiO_2	0.35	0.32	0.36	0.37	0.50	0.35	0.21
P_2O_5	0.22	0.22	0.25	0.27	0.27	0.29	0.11
MnO	0.10	0.09	0.06	0.68	0.12	0.06	0.04
L.O.I.	0.34	0.14	0.69	0.35	0.76	1.69	0.18
Total	100.29	100.31	100.30	100.20	99.62	99.86	99.33

*Samples:

1. Quartz diorite, non-foliated, from west-central belt of foliated rocks.
2. Biotite hornblende granodiorite, non-foliated, from central part of map-area.
3. Quartz monzonite, foliated, from west-central belt of foliated rocks.
4. Biotite garnet gneiss, from west-central belt of foliated rocks.
5. Hornblende granodiorite, foliated, from eastern belt of sheared granodiorite.
6. Biotite granodiorite, foliated, mineralized, from MINTO-DEF deposit.
7. Dacite porphyry, from dyke in western part of area.

[1]Analyzed by Bondar-Clegg & Company Limited, Vancouver.

Granodiorite boulder conglomerate (Unit 4) overlies granodiorite in the southeast part of the map area on the west side of Big Creek and south of the airstrip on the MINTO property and up to 60 m was encountered in drill holes immediately northwest of the airstrip. The conglomerate is composed of poorly sorted, subrounded pebbles, cobbles and boulders of locally derived granodiorite, including both massive and foliated varieties, in a sandy, reddish-brown, hematitic matrix. Pebbles of dark green, massive, fine-grained basalt were noted in a few places. The contact with the underlying granodiorite varies from sharp to gradational suggesting that it formed, at least in part, by *in situ* weathering of the granodiorite. The conglomerate is overlain locally by Carmacks Group volcanics, indicating an Eocene or older age.

Dacite porphyry (Unit 5) occurs as northeast-trending dykes ranging from 15 to 80 m across. The dacite porphyry consists of approximately 60 per cent subhedral to euhedral plagioclase phenocrysts ranging from 2 mm to 1 cm across. Euhedral biotite, subhedral hornblende and anhedral quartz-eye phenocrysts each make up about 5 per cent and range from 1 to 5 mm in size. The matrix consists of a fine-grained to aphanitic mixture of quartz, K-feldspar and biotite and is typically grey in colour. The dacite porphyry intrudes Klotassin granodiorite and, locally, gabbro and pyroxenite. It is probably equivalent to the feldspar porphyry dyke swarms in eastern Snag and western Aishihik Lake map-areas which have been dated as Eocene in age (Tempelman-Kluit and Wanless, 1975). An analysis of the dacite porphyry is included in Table 1. On the AFM diagram in Figure 3, dacite porphyry plots in the granite to granodiorite range.

Sandstone (Unit 6) is exposed in a section on the west side of Big Creek in the southeast corner of the Minto area. The section is 25 m thick and dips 20° to the southeast. The lower part of the exposed section consists of poorly indurated, brown-weathering, coarse-grained, locally cross-bedded sandstone and grades, over approximately 0.1 m, into orange-weathering, fine-grained tuffs and finely laminated sandstone which contains a few plant fragments. Similar grey tuffaceous sediments containing carbonaceous fragments were encountered in a drill hole south of the airstrip on the MINTO property. The sediments here appear to be underlain by granodiorite boulder conglomerate to the north and overlain by Carmacks Group basalt and andesite flows to the south. This unit is probably correlative with other immature clastic sediments overlain by Carmacks Group volcanics described elsewhere in the Dawson Range (Tempelman-Kluit, 1974b) and is likely Eocene or younger in age.

In the southern part of Minto area, Klotassin granodiorite and Triassic volcanic rocks are unconformably overlain mainly by Carmacks Group basalt and andesite flows and flow-breccias which dip approximately 10° to the south. The flow rocks are massive and fine-grained with few small phenocrysts of chloritized pyroxene. They are dark green to brown on a fresh surface and weather to a reddish-brown. The flow-breccia consists of angular fragments of andesite and basalt in a matrix of similar composition. Narrow (0.1 to 1 m), north to north-east trending dykes of fine-grained andesite and basalt (Unit 7b) which intrude Triassic granodiorite are probably related to feeders for the Carmacks flows. The age of the Carmacks Group volcanics is thought to be Eocene or younger (Tempelman-Kluit, 1974b).

Massive basalt and andesite flows of the Selkirk Series (Unit 8) unconformably overlie Triassic granodiorite in the northwestern part of the Minto area. The flows in this area are fresh, dark grey, fine- to medium-grained and commonly vesicular. Similar rocks north and west of the Minto area are described in detail by Bostock (1936), who has presented evidence of a Pleistocene age for these flows.

Recent alluvium (Unit 9) related to the most recent glaciation occurs mainly as a thick blanket in the Yukon River valley in the Minto area. Isolated gravel terraces occur in the western part of the area. Fine, white volcanic ash, known as White River ash, occurs locally throughout the area as a thin (up to 2 cm) bed at the surface or beneath a few centimetres of soil. The nature and distribution of this 1,500 year old ash are described by Lerbekmo and Campbell (1969).

MINERAL DEPOSITS

One subeconomic copper deposit and several significant mineralized zones occur in the Minto area apparently lying conformably within strongly foliated Triassic granodiorite. The following is a description of these occurrences and a discussion of their possible origins and controls.

Minto Copper Deposit:

The Minto copper deposit is situated 5 miles (8 km) southwest of the Yukon River near the headwaters of a small creek referred to locally as Copper Creek (Figure 1). The southern portion of the deposit is covered by the MINTO claims and the northern portion by the DEF claim group. During the period 1971 to 1974, Silver Standard Mines Limited and American Smelting and Refining Company carried out geological, geochemical, magnetic, eletromagnetic and induced polarization surveys, bulldozer trenching and over 91,000 feet (28,000 m) of drilling in 139 holes on the MINTO claims. On the DEF claims, United

Keno Hill Mines Limited, Falconbridge Nickel Mines Limited and Canadian Superior Exploration Limited conducted geological, geochemical, magnetic, electromagnetic and induced polarization surveys, bulldozer trenching and drilled 93 holes totalling more than 52,000 feet (16,000 m). Work on the MINTO and DEF properties is summarized by Sinclair et al (1975, pp. 96-100). A joint feasibility study on the deposit completed in 1976 indicated that production would be uneconomic under current economic conditions and, consequently, the property is presently inactive.

Diamond drill core from the DEF and MINTO properties was examined and logged by the author and used to construct the plan and representative cross-sections shown in Figure 4.

The Minto deposit occurs in the central part of the west-central belt of strongly foliated granodiorite (Figure 1). The host granodiorite ranges in composition from quartz diorite to quartz monzonite (Figure 2) and is marked by varying degrees of foliation. Massive to weakly foliated granodiorite is characterized by a total lack or only a slight tendency of mafic minerals, principally biotite, to be aligned. In weakly to moderately foliated granodiorite, biotite exhibits a distinct subparallel alignment and orthoclase phenocrysts may display a subtle alignment. Moderately to strongly foliated granodiorite contains mafic-rich bands in which biotite grains are oriented subparallel to parallel. Strongly foliated to gneissic granodiorite is marked by gneissic, compositional layering, and includes bands of quartzo-feldspathic gneiss and biotite-garnet gneiss. Zones of strong foliation vary from less than 1 m up to 100 m wide and commonly grade into weakly foliated to massive granodiorite, although gneissic zones tend to have sharp contacts.

Mineralization in the Minto deposit consists mainly of disseminated and blebby sulphides in zones of moderate to strong foliation and in gneissic zones, commonly with a high proportion of biotite although locally sulphides are concentrated in quartzo-feldspathic gneiss. Weakly disseminated sulphides occur in weakly foliated to massive granodiorite in places. On a gross scale, zones of disseminated sulphides are conformable with the foliation of the host rocks. They appear to be continuous in drill intersections although core angles on the foliation commonly range from 0° to 90° suggesting more complex internal structures.

The main mineralized zone of the Minto deposit is irregular, flat-lying, north to north-west trending and measures approximately 1,600 feet (500 m) long, up to 800 feet (240 m) wide and 50 feet (15 m) to 200 feet (60 m) thick. It is more-or-less continuous although sulphide-deficient lenses of foliated and massive granodiorite occur within it and zones of low grade mineralization appear to be separated from it. The main zone tends to pinch out and grade into weakly foliated to massive granodiorite except to the north, where it is truncated by a fault striking 100° and dipping 60° to the north. The displacement on this fault is not known and the extension of the main zone north of this fault has not yet been discovered. At its southern end, the main zone subcrops beneath 250 feet (78 m) of overburden. To the north, the zone is overlain by up to 200 feet (60 m) of bedrock.

Published reserves are 7,221,000 short tons grading 1.86 per cent copper, 0.2 ounces per ton silver and 0.015 ounces per ton gold (F.A. Godfrey, remarks to 30th Annual Meeting of United Keno Hill Mines Limited, April 6, 1977). Copper content is highest in the west-central portion of the deposit and falls off gradually towards the margins of the mineralized zone except along the northwest margin where it decreases more abruptly. Silver content ranges from 0.1 to 0.7 ounces per ton and gold content from 0.005 to 0.06

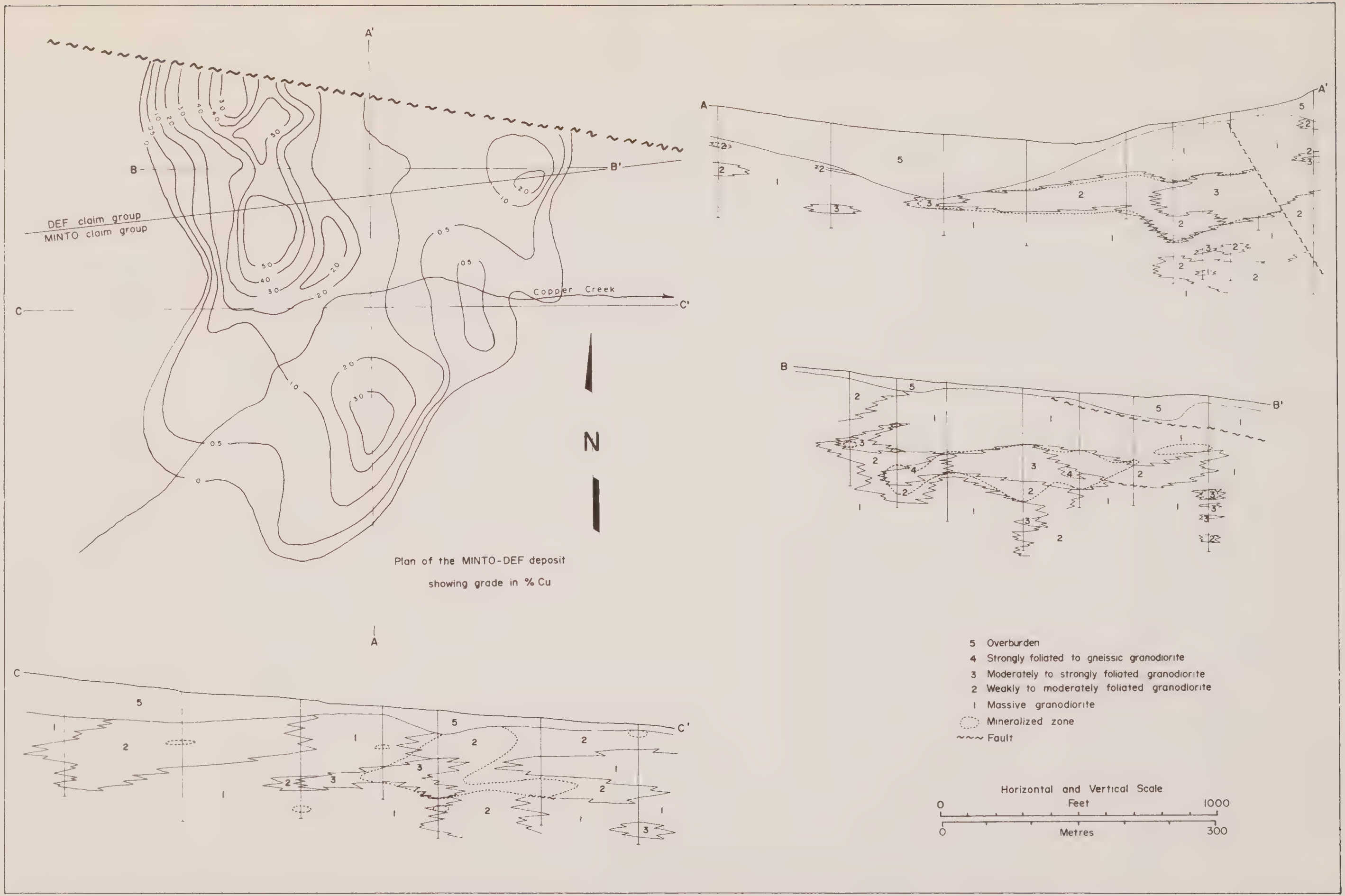

Figure 4. Plan and cross-sections of the Minto copper deposit.

ounces per ton (Northern Miner, November 22, 1973, p. 24). High gold and silver contents correspond closely with high copper content.

The mineralogy of the Minto deposit is relatively simple. Chalcopyrite and bornite are the main ore minerals and occur typically as irregular disseminated grains averaging 0.5 to 1 mm in size although locally they form irregular, coalescing masses up to 3 cm long parallel with the foliation of the host rock. Bornite is most abundant in the west-central, high-grade portion of the deposit where it is associated with chalcopyrite and varying amounts of magnetite. Outward from this central zone, bornite is minor or absent and chalcopyrite is the dominant sulphide. Up to several per cent disseminated pyrite occurs around the fringes of the deposit. Hessite (Ag_2Te) and native gold have been identified in the high-grade portion of the deposit as microscopic inclusions in bornite (Pearson and Clark, 1977). Secondary minerals occur locally at the southern end of the deposit where it subcrops beneath overburden and they include malachite, azurite, chalcocite and native copper.

Various types of alteration have been recognized in the Minto deposit. Argillic and sericitic alteration are well-developed locally in mineralized zones but their distribution is erratic and apparently not extensive. Minor potassic alteration consisting of secondary potash feldspar also occurs locally. The most striking alteration is zeolitic alteration consisting of replacement of plagioclase by laumontite*, and alteration of mafic minerals to chlorite and hematite. In places, the host rock is completely altered to a mixture of fine, crystalline laumontite, typically light pink in colour, and earthy, brown hematite in which the original texture of the rock is totally destroyed. This alteration is best developed locally in rocks immediately adjacent to the fault truncating the north end of the deposit and gradually dies out within 15 m from the fault. Thus the zeolitization appears to be fault-controlled and not related to the mineralized zones.

Geochemical and geophysical surveys conducted over the Minto deposit were relatively unsuccessful in outlining the main mineralized zone. Except for the southern end which is covered by up to 78 m of overburden, the main zone does not outcrop and has no expression in soil geochemistry. Induced polarization surveys have had some success in outlining mineralized zones, but the sulphide content is too low to give an electromagnetic response and there is insufficient magnetite associated with the deposit to allow magnetic surveys to distinguish the mineralized zones from magnetite-bearing host rocks.

MINTO Claims:

The MINTO claims, which contain part of the Minto copper deposit described in the foregoing section, also contain additional mineralized zones of low grade copper which occur south to southeast of the Minto deposit (Figure 1). Four zones were explored by Silver Standard Mines who carried out bulldozer trenching and nearly 10,000 feet (3,000 m) of diamond drilling distributed over 20 holes during 1971 and 1972 (Craig and Milner, 1975, pp. 65-66). These zones have been estimated to contain approximately 2.5 million tons of 1.5 per cent copper (Northern Miner, September 20, 1973, p. 6). Mineralization consists of disseminated chalcopyrite and bornite confined mainly to gneissic zones in granodiorite. The gneissic zones trend 330° and have an average dip of 45° to the northeast. A zone of low grade mineralization is also exposed in trenches east of the airstrip on the MINTO property. Malachite staining, along with a local high grade, massive pod of chalcopyrite and bornite up to 1 foot (0.3 m) thick, occurs here in strongly foliated granodiorite trending 330° and dipping 30° to 45° to the southwest.

*Identified by X-Ray Diffraction Laboratory, Geological Survey of Canada

Additional mineralized zones of good grade copper were discovered on the MINTO claims by Asarco during exploratory drilling carried out on the property in 1974 (Northern Miner, August 15, 1974, p. 11). Hole No. 125, drilled 3,000 feet (900 m) east of the south end of the main zone of the Minto deposit, cut 33 feet (10 m) of 2.10 per cent copper from 608 to 641 feet (185 to 195 m), or 63 feet (19 m) of 1.36 per cent copper from 578 to 641 feet (176 to 195 m). Hole 108, 2,000 feet (610 m) southeast of the main zone and adjacent to the northernmost zone outlined by Silver Standard, intersected 50 feet (15 m) of 1.71 per cent copper from 656 to 706 feet (200 to 215 m) and 130 feet (40 m) of 1.08 per cent copper from 746 to 876 feet (227 to 267 m), or 220 feet (67 m) of 1.03 per cent copper from 656 to 876 feet (200 to 267 m).

BEN, PAL Claims:

This property, which adjoins the eastern boundary of the MINTO group, was staked in September 1971 by G. Wing of Whitehorse and subsequently optioned to Dawson Range Joint Venture. Soil sampling in 1972 outlined a copper anomaly in an area of visible malachite staining and bulldozer trenching in 1973 across the anomaly exposed two low grade mineralized zones, one of which assayed 0.32 per cent copper over 20 feet (6.1 m).

Four holes totalling 2,250 feet (686 m) were drilled on the property in 1974. Hole B-1, drilled 1,000 feet (305 m) east of the mineralized zones to test an EM-16 anomaly, encountered mainly porphyritic granodiorite, only weakly foliated and non-mineralized. Holes B-2, 3 and 4 were drilled beneath the mineralized zones and encountered several zones of low grade copper (Sinclair et al, 1975, pp. 100-101).

The mineralized zones consist of disseminated chalcopyrite, bornite, magnetite and pyrite in addition to secondary malachite, azurite and chalcocite. The zones occur in strongly foliated to gneissic granodiorite trending 330° and dipping 45° to 80° to the southwest.

COMANCHE Claims:

These claims were staked in 1971 on the western side of the MINTO claims and are currently owned by Pinnacle Mines Limited and Yukon Gold Placers Limited. Work on the property includes bulldozer trenching in 1972 and five holes totalling 2,793 feet (851 m) of diamond drilling in 1974 (Sinclair et al, 1975, pp. 101-102). The trenching exposed minor malachite staining in granodiorite and the drilling intersected a zone of disseminated chalcopyrite in gneissic granodiorite which assayed 0.48 per cent copper over 1.8 feet (0.5 m).

NAVAJO Claims:

The NAVAJO claims are adjacent to the southwest and northwest boundaries of the DEF claim group. The claims were staked in 1973 and subsequently acquired by Black Giant Mines Limited.

A ground magnetic survey carried out in 1974 outlined a north- to northwest-trending anomaly coincident with a copper anomaly. Bulldozer trenching across the anomalous zone exposed weakly mineralized zones in strongly foliated to gneissic granodiorite. These zones were tested in 1974 by five diamond drill holes totalling 2,685 feet (818 m) but only trace amounts of copper were encountered (Sinclair et al, 1975, pp. 102-103).

The mineralized zones consist of minor amounts of malachite and azurite found in fractures and as small grains disseminated along foliation planes. Magnetite and almandine are abundant locally. The zones vary from 1 to 30 feet (0.3 to 9 m) wide, striking approximately north-south and dipping 60° to 70° to the east.

COIN Claims:

Copper was discovered on this property in 1902 and staked as the HARDLUCK claims. Work at that time included a short adit. In 1907, the property was restaked as the COPPER COIN group but subsequently lapsed and was allowed to remain dormant until 1970 when it was restaked as the COIN claims. The property lapsed and was restaked again in 1971 as the COIN claims by Taseko Mines Limited, the current owners. Subsequent work by Taseko included trenching and 988 feet (301 m) of diamond drilling in three holes (Sinclair et al, 1975, p. 110). The trenching exposed a mineralized zone which assayed 0.27 per cent copper, 0.06 ounces per ton silver and traces of gold over 45 feet (13.7 m). Two grab samples from the vicinity of the old adit assayed 6.77 per cent copper, 1.28 ounces per ton silver and less than 0.003 ounces per ton gold; and 4.40 per cent copper, 0.99 ounces per ton silver and 0.011 ounces per ton gold respectively. The drilling encountered only irregularly distributed, low grade mineralization.

The copper showings on the COIN claims occur in highly chloritized and epidotized massive green volcanic rocks of Unit 2. The volcanics are close to the contact with strongly foliated granodiorite and are intruded by dykes or sills of granodiorite porphyry. Bornite and chalcopyrite with minor covellite, chalcocite and native copper occur as disseminated grains and irregular stringers in the altered volcanics but their distribution is local and erratic.

Possible Origin of the Minto Deposits:

There is little agreement concerning the origin of the Minto deposit. Kirkham (1974) has suggested that it may be a highly metamorphosed and remobilized stratiform deposit in metasedimentary rocks despite the potassic nature of the host rocks and relatively high gold content. Tempelman-Kluit (1975) considered the deposit to have been hydrothermally emplaced in schlieren or screens of poorly digested Pelly Gneiss in Klotassin granodiorite during the late stages of formation of granodiorite from the Pelly Gneiss. According to Gale (1976), the deposit formed primarily by segregation and concentration of sulphides within an igneous melt as the granodiorite crystallized. Pearson and Clark (1977) stated that the mineralization pre-dates the metamorphism which produced the foliation and is possibly hydrothermal or sedimentary in origin. The following features of the copper deposits and occurrences of the Minto area are considered pertinent to any discussion of their origin:

1) All of the known occurrences, with the exception of the COIN showing which is in Triassic volcanic rocks, are restricted to a belt of moderately to strongly foliated granodiorite. The belt is in the form of a broad, open, synclinal structure with the Minto deposit in flat-lying foliated rocks along the central axis and other mineralized zones in moderately to steeply-dipping foliated rocks along the limbs of the syncline.

2) Mineralized zones appear to be conformable to foliated zones in the granodiorite and are preferentially concentrated in both biotite-rich and quartzo-feldspathic bands.

3) The foliated and mineralized host rocks are generally similar both chemically and mineralogically to the massive, non-mineralized granodiorite except that some of the gneissic bands contain almandine, which does not occur in the massive granodiorite.

4) The main deposit shows distinct zoning from a high grade central zone characterized by abundant bornite and chalcopyrite to a lower grade outer zone consisting of chalcopyrite with increasing pyrite toward the fringes of the deposit.

5) There is a lack of extensive alteration associated with the deposits.

These features are consistent with a pre-metamorphic origin for the mineralized zones. Migmatitic relationships between Yukon Metamorphic Complex or equivalent rocks and Klotassin granodiorite have been described over wide areas in the Yukon Crystalline Terrane (Bostock, 1936; Tempelman-Kluit, 1974b) and the foliated zones in the Minto area are thought to be poorly digested, migmatized remnants of Yukon Complex rocks within the granodiorite. The mineralized zones probably had the same general distribution and zoning pattern prior to migmatization as they now display because there is little alteration to suggest any major hydrothermal introduction or remobilization of sulphides during, or subsequent to, migmatization.

The nature of the original host rocks and origin of the related mineralization are highly speculative. Almandine and biotite are typically formed by low-grade metamorphism of pelitic rocks (Winkler, 1974) and a sedimentary origin for the host rocks is favoured. However, the chemical and mineralogical data presented here are inconclusive and a volcanic origin cannot be ruled out. Copper, along with gold and silver, may have been introduced at the time the sediments, or volcanics, were formed but could also have been hydrothermally emplaced prior to metamorphism.

<u>The Williams Creek Deposit</u>:

The Minto deposit is similar in many respects to the Williams Creek deposit which occurs 25 miles (40 km) to the south-southeast. The following description is taken from Craig and Milner (1975) and from A.R. Archer (pers. comm.).

The Williams Creek property is underlain mainly by biotite-hornblende granodiorite of the Klotassin Batholith. Strongly foliated to gneissic zones occur within the granodiorite and at least thirteen are mineralized, of which the most important is the No. 1 Zone. This zone is a hornblende-biotite-quartz-feldspar gneiss containing disseminated mineralization. It is a north-northwest trending tabular body approximately 100 feet (30.5 m) thick, 1,600 feet (490 m) long and dipping 70° to the east. To the north, the zone grades into massive, non-mineralized granodiorite; to the south, it is terminated by a fault.

Chalcopyrite and bornite are the primary sulphide minerals and occur as small (0.1 to 0.2 mm) interstitial grains typically in zones parallel with the foliation and concentrated in biotite-rich bands, also parallel with the foliation. Bornite is most abundant in the northern end and in the upper part of the deposit. The bornite zone gives way to the south and with depth to a zone of bornite and chalcopyrite, which, in turn, gives way to a zone of chalcopyrite and pyrite. The deposit is extensively oxidized and secondary minerals are present to a depth of 800 feet (240 m). Oxide minerals are mainly malachite and azurite in an amorphous mixture of copper and iron oxides

referred to as "pitch copper" or "pitch limonite" (Abbott, 1971). Geological reserves in the Williams Creek deposit, including the oxidized zone, are approximately 16 million tons of 1 per cent copper (A.R. Archer, pers. comm.).

The Williams Creek deposit is comparable to the Minto deposit in both the type of host rock and nature and distribution of the mineralization and a similar origin is inferred. However, Archer (pers. comm.) believes the gneissic zones originated as xenoliths of Triassic massive volcanics which were incorporated in and partially digested by the granodiorite.

Exploration for Minto-type Deposits:

The uncertainty of the origin of the Minto and Williams Creek deposits makes formulation of exploration guidelines rather tentative. If rocks of the Yukon Metamorphic Complex are indeed the source of these deposits, then similar, or equivalent, deposits may occur within them. Although mineral occurrences are relatively scarce in the Yukon Metamorphic Complex, there is at least one, the Lucky Joe prospect south of Dawson, which may be equivalent. This occurrence consists of chalcopyrite, pyrite and minor molybdenite which occur as disseminations and in fractures parallel to foliation in biotite and quartz-muscovite schists (Sinclair *et al*, 1976, pp. 80-81). Therefore, although the Yukon Metamorphic Complex is poorly understood and associated mineral deposits scarce, its potential for hosting Minto-type deposits should not be overlooked.

The deposits of the Minto area occur within a belt of foliated granodiorite which trends south-southeast towards the Williams Creek deposit. The area between these two groups of occurrences may be part of a continuous belt and is an obvious area warranting further exploration. Belts of foliated rocks occur elesewhere in Klotassin granodiorite and these, too, are obvious areas to prospect.

Visual prospecting and geochemical techniques have been used to locate nearly all of the known zones of mineralization. Detailed induced polarization surveys have been successful in outlining some mineralized zones. Magnetic surveys have been used to locate magnetite-rich areas within the foliated zones but, as on the NAVAJO claims, these do not necessarily indicate the presence of copper.

ACKNOWLEDGMENTS

The writer is very grateful for the generous assistance provided in the field by United Keno Hill Mines Limited, American Smelting and Refining Company Limited and Archer, Cathro and Associates Limited. J.A. Morin and R.V. Kirkham kindly read the manuscript and their helpful comments are much appreciated.

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Ag-Pb-Zn Mineralization in the MM Deposit and Associated Mississippian Felsic Volcanic Rocks in the St. Cyr Range, Pelly Mountains

by J.A. Morin

Introduction

A sequence of Mississippian felsic volcanic rocks up to 600 m thick occurs in the St. Cyr Range of the Pelly Mountains. In the past few years, exploration work on an Ag-Pb-Zn prospect near Seagull Creek, the MM deposit, has sparked interest in the volcanic belt as a potential host for stratabound volcanogenic massive sulphide mineralization. This preliminary report is in response to this interest which will probably be expressed in summer 1977 by a relatively high level of mineral exploration.

Location and Access

The volcanic rocks occur in a belt 80 km long and up to 25 km wide that is located about 35 km south of Ross River and the Robert Campbell Highway and east of the South Canol Road. Access is provided by float equipped aircraft to a few small lakes in the area: Grayling Lake, near the south end of Seagull Creek, 25 km east of the Canol Road and McNeil Lake, 65 km east of the Canol Road and 50 km south of the Robert Campbell Highway. In addition, a fixed wing airstrip is located beside the Ketza River, about 50 km south of Ross River. Three tote trails also provide access to the area. A tote trail suitable for four-wheel drive vehicles follows Groundhog Creek from the Canol Road to Seagull Creek, then south to Grayling Lake and north beside the McConnell River to near the COOT property (#4 on map). Another tote trail extends south from the Robert Campbell Highway to the HOO property and further south to the JOE property, 20 km east of McNeil Lake. In addition, a tote trail extends south from the Robert Campbell Highway along the Ketza River to the vicinity of the KEY and KETZA properties (#9, 10, 11 on map).

List of Showings

1 - MM
2 - BNOB
3 - CHZERPNOUGH
4 - COOT
5 - Canol Mines Ltd. - Groundhog Creek
6 - MAT
7 - GULL
8 - JOE (F.H.)
9 - KEY
10 - F-2, F-3
11 - A-1
12 - BELL
13 - CPA

Previous Work

Early geological mapping of the area was conducted by the Geological Survey of Canada in the late 1950's (Wheeler _et al_, 1960a, b) at a scale of 1:250,000. Subsequent mapping has been performed by D.J. Tempelman-Kluit, of the G.S.C. during 1973 to 1976 at the same same scale and Preliminary Series maps of 105 F, G are due to be released as Open File reports in the latter half of 1977.

DISTRIBUTION OF MISSISSIPPIAN FELSIC VOLCANIC ROCKS AND ASSOCIATED MINERALIZATION IN THE ST. CYR RANGE, PELLY MOUNTAINS 105 F,G

(Geology modified after D. Tempelman-Kluit, 1977)

1

Geology

A 600 m thick section through the volcanic belt east of McConnell River shows that it can be sub-divided into the following lithofacies arranged in order of abundance: 1) volcaniclastics, 2) siltstone, 3) lava flows, 4) syenite plugs and 5) exhalites.

The volcaniclastic rocks consist of poorly layered to massive beds of tuff, lapilli tuff and breccia tuff. Lithic fragments are commonly trachyte, tuff, argillite and chert and are usually rounded and lenticular to blocky in shape. Phenoclasts of K-feldspar and perthite also occur. The matrix is largely made up of fine-grained hematite, feldspar and siderite.

The siltstone ranges from grey to black to buff in colour and is usually finely layered. Constituent minerals are feldspar with minor quartz, opaques, sericite, biotite and carbonate.

Trachyte lava flows occcur as thin blocky weathering, creamy grey, fine- to coarse-grained rocks up to several metres thick intercalated with the volcaniclastic and sedimentary rocks. They consist of subparallel masses of elongate Carlsbad-twinned K-feldspar grains varying in length from 0.1 mm to greater than 1 cm. Minor conformable lenticles of hematite and siderite and orange-brown siderite amygdules are present. Porphyritic varieties with perthite phenocrysts also occur.

Coarse-grained syenite plugs with rounded outlines are intrusive to the volcanic belt. Locally, the contacts between the trachyte flows and syenite are gradational and indicate that the syenite plugs are hypabyssal in nature and probably represent former volcanic centres. Perthite, biotite, stilphomelane, magnetite and relict hornblende and clinopyroxene constitute the syenite, along with very minor accessory magnetite and fluorite.

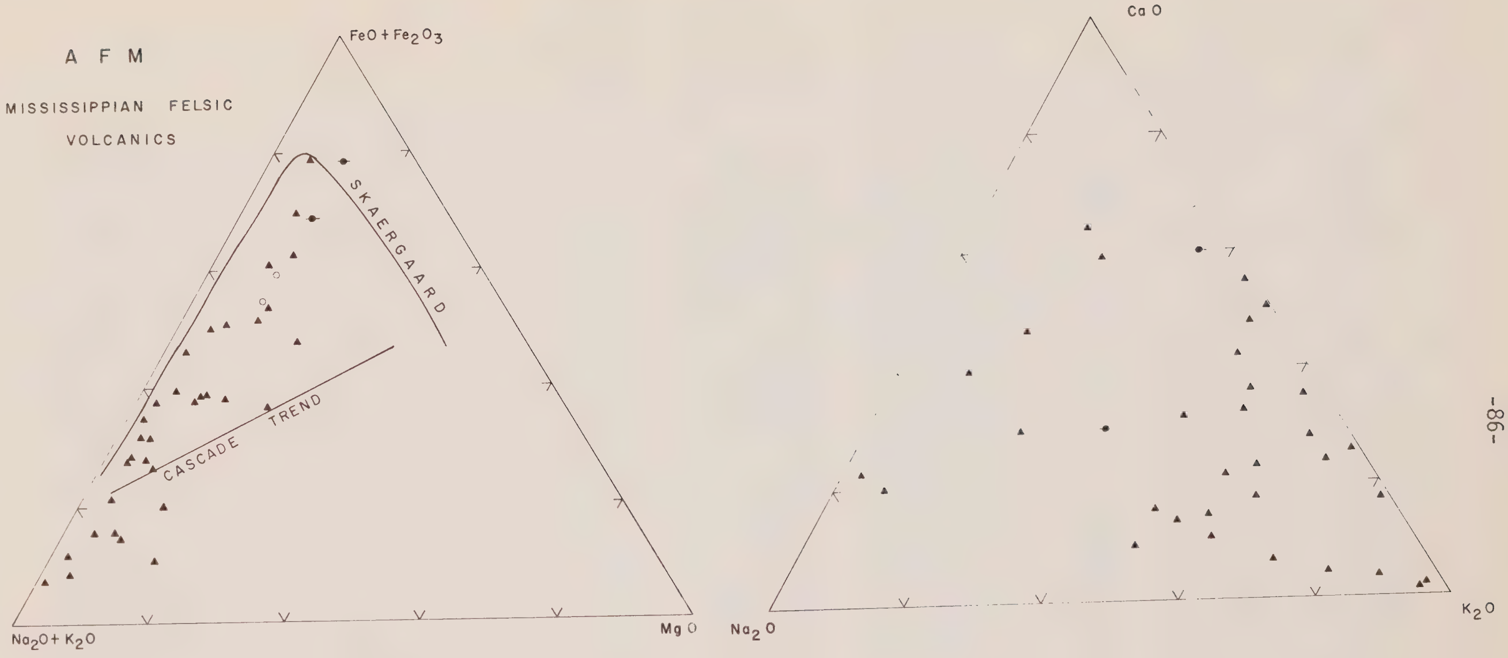
Several types of exhalites occur within the volcanic belt. Pyritic chert is the most common and it forms extensive gossans upon weathering. Much more restricted in extent are the barite horizons and pyritic iron formations. Locally, disseminated, layered and massive sulphide mineralization is associated with the exhalites.

Structure

The volcanic belt lies within the Pelly-Cassiar Platform which is bounded to the southwest by the Yukon Crystalline Terrane and to the northeast by the Selwyn Basin (D.J. Tempelman-Kluit, 1977a). Thrust faults have affected all the rocks to a major degree and the Mississippian volcanics are bottomed, internally sliced and topped by thrust faults. Traces of the thrusts are not easy to determine and accordingly, the real thickness of the volcanic pile is unknown and the 600 m thickness only an approximation.

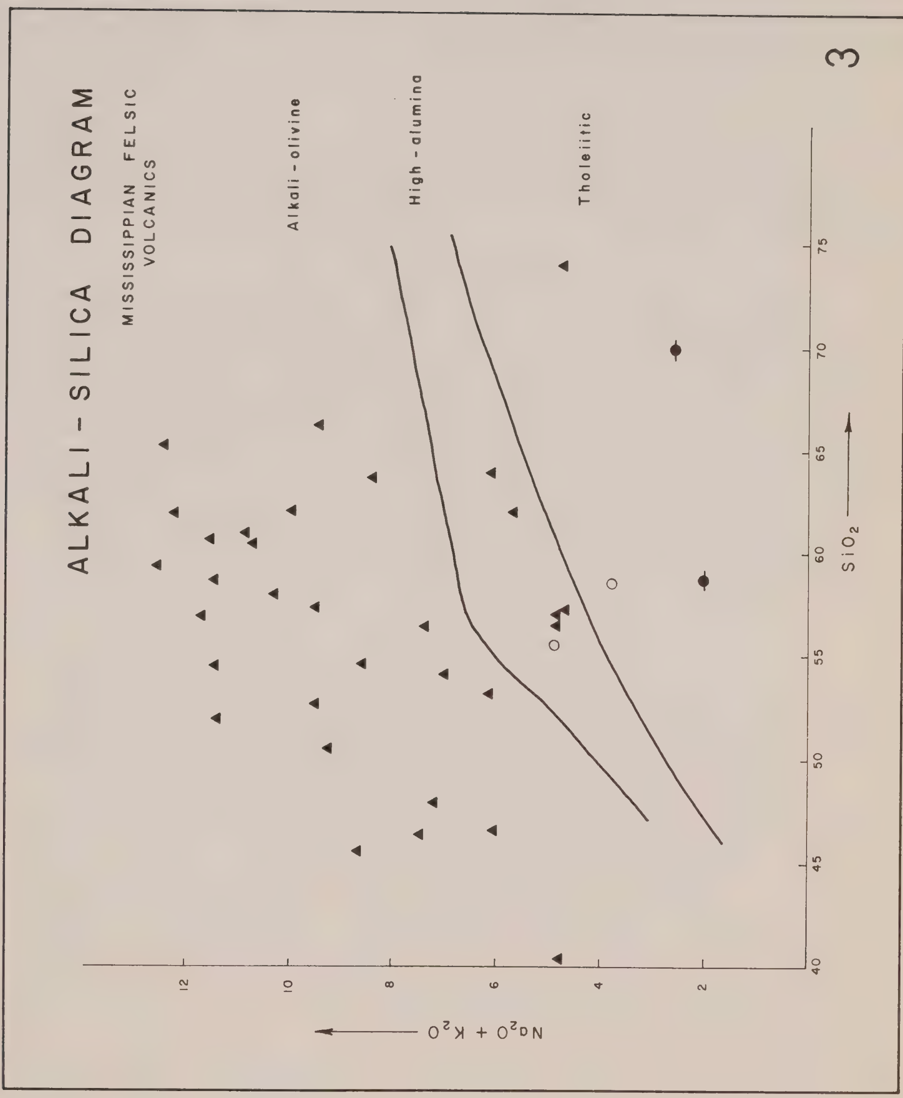
Geochemistry

Chemical analyses indicate that most of the volcanic rocks of the Seagull Creek volcanic belt are alkali rich and potassic. The analyses plot in the alkalic region on the alkali-silica diagram and follow the tholeiitic trend toward alkali enrichment on the AFM diagram. However, rocks of calc-alkaline affinity such as rhyolite have been described from the southwestern portion of the belt (F. Marshall Smith, 1977, Personal Communication).



AFM and CaO-Na$_2$O-K$_2$O diagrams for Mississippian felsic volcanics and associated hypabyssal rocks (▲) and rocks from the MM deposit felsic hangingwall (o) and intermediate footwall (•)

2



ALKALI - SILICA DIAGRAM
MISSISSIPPIAN FELSIC VOLCANICS
Alkali - olivine
High - alumina
Tholeiitic
$Na_2O + K_2O$
12
10
8
6
4
2
40
45
50
55
60
65
70
75
SiO_2
3

Barium, uranium, thorium and fluorine were also determined. The barium content of 34 samples is significantly high and averaged out to 1,813 ppm. The high barium contents in the volcanic rocks suggests that they may be the barium source for the widespread barite horizons in the Besa River Formation to the east. Uranium values are low (average <0.6 ppm) and probably reflect surface leaching by water (32 samples). However, the values for thorium are relatively high (average 31 ppm) and suggest that the associated uranium values were higher prior to exposure of the rocks to aqueous leaching agencies. Fluorine is characteristically high and averaged out at 1,643 ppm with a range from 285 to 6,300 ppm (34 samples).

Mineralization

Silver, lead and zinc in the form of argentiferous galena and sphalerite and barium in barite constitute most of the mineralization associated with the volcanic rocks. Two main styles of mineralization occur: stratabound-type and vein-type.

Stratabound-type

The stratabound type is best exemplified by the MM deposit of Cyprus Anvil. The MM deposit occurs in a pyritic quartzite bed that is situated between intermediate and felsic metavolcanic rocks. The deposit consists of three separate mineralized lenses, each in the order of a hundred metres long and several tens of metres thick. These lenses have suffered extensive deformation and folding and probably coalesce at depth to form one horizon. At least three distinct periods of folding have taken place and much of the stratigraphic sequence is isoclinally folded and overturned. In addition, the terrane bounds the north end of the Big Salmon Complex and metamorphism has changed the mineral assemblage to that of the amphibolite facies. A good portion of the following information presented here is derived from examination of diamond drill core, mainly DDH 76-06.

Host Rocks

Metavolcanic rocks of intermediate to felsic composition host the deposit. The footwall consists of mainly dark grey to green, feldspar-quartz-actinolite-biotite ± garnet schist and gneiss. Commonly, dark mafic layers 1 to 10 mm thick alternate with light grey quartzo-feldspathic layers of similar thickness. Red garnet is present as thin lenses or layers within the gneiss and generally associated with the garnet and other mafic minerals is fine- to medium-grained shreddy pyrrhotite, in the order of 2 to 5 mm long. Pyrrhotite occurs as thin layers, veinlets and as disseminated grains. It makes up less than 5 per cent of the rock, but locally, as in the few feet below the mineralized horizon, it increases to about 20 per cent. Pyrite is present in very minor amounts throughout the rock as thin veinlets, rare euhedral porphyroblasts and layers of colloform material. Chalcopyrite is present as rare fine anhedral patchy grains within thin chloritic veinlets. Throughout the rock, minor siliceous veinlets of quartzo-feldspathic composition are present lying both conformable with and transverse to the foliation.

The hangingwall consists of pale greenish grey, quartz-feldspar-muscovite-calcite-zoisite-biotite-schist with minor locally disseminated, fine- to medium-grained pyrite and pyrrhotite. In outcrop, the schist retains enough primary features to show that in part, it is a felsic breccia with lensoid clasts of creamy white porphyritic felsic volcanics enclosed within a matrix of sericite-chlorite-quartz schist.

STRUCTURE AND GEOLOGY OF THE PYRITIC QUARTZITE HORIZON, M M GROUP, SEAGULL CREEK AREA, 105F-7 (Modified after D. Jennings 1976)

LEGEND

Pyritic quartzite horizon

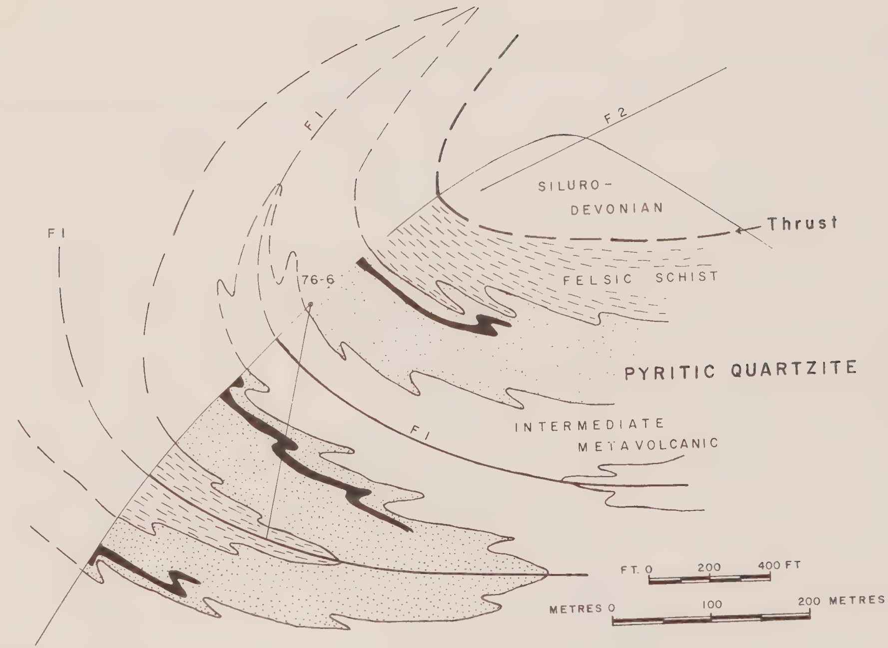
Massive sulphide horizon

•76-6 Diamond drill hole collar

Creek

Geological contact

4



M M DEPOSIT

SCHEMATIC STRUCTURAL INTERPRETATION

5

(Profile looking S.E. and perpendicular to F2 axial plane; Modified after map by company geologists)

CHEMICAL ANALYSES OF ROCKS FROM THE MM DEPOSIT

	Footwall		Quartzite	Massive Sulphide	Barite Horizon	Hangingwall	
	1	2	3	4	5	6	7
SiO_2	70.0	58.9	60.4	14.0	0.4	58.6	55.6
Al_2O_3	10.9	9.9	18.5	6.9	0.2	12.0	17.2
Fe_2O_3	1.3	1.1	7.3	22.7	4.6	0.4	1.4
FeO	7.6	13.9	0.5	5.8	0.3	7.1	6.3
MgO	1.4	2.1	1.0	1.1	0.1	1.3	1.5
CaO	1.1	3.0	0.4	3.3	0.1	7.5	5.5
Na_2O	1.3	0.3	0.20	0.65	0.10	0.3	0.65
K_2O	1.3	1.75	5.4	1.25	0.2	3.5	4.25
TiO_2	0.50	0.44	0.25	0.50	0.02	0.35	0.54
MnO	0.26	0.24	0.01	0.15	<0.01	0.21	0.17
P_2O_5	0.02	0.01	0.03	0.02	0.01	0.07	0.09
L.O.I.@ 950°C	1.9	3.1	5.4	17.1	2.8	4.3	2.0
S	0.3	4.6	4.9	28.7	15.8	2.2	1.6
Sub-Total	97.88	99.34	104.29	102.17	24.64	97.83	96.80
Cu	n.d.	n.d.	16 ppm	490 ppm	38 ppm	n.d.	n.d.
Pb	n.d.	n.d.	260 ppm	3.2%	0.40%	n.d.	n.d.
Zn	n.d.	n.d.	23 ppm	6.4%	0.37%	n.d.	n.d.
Cd	n.d.	n.d.	1 ppm	370 ppm	14 ppm	n.d.	n.d.
Bi	n.d.	n.d.	<5 ppm	<5 ppm	<5 ppm	n.d.	n.d.
Ba	n.d.	n.d.	1.21%	1.66%	53.8%	n.d.	n.d.
Hg	n.d.	n.d.	170 ppm	475 ppm	500 ppm	n.d.	n.d.
Te	n.d.	n.d.	<0.5 ppm	2.5 ppm	0.5 ppm	n.d.	n.d.
Au	n.d.	n.d.	5 ppm	40 ppm	95 ppm	n.d.	n.d.
Ag	n.d.	n.d.	1.3 ppm	36 ppm	22 ppm	n.d.	n.d.

Note: n.d. - not determined

#1 - MZ-5, split core sample of footwall, DDH 76-6, 480.5 ft. to 481.0 ft.

2 - MZ-6, split core sample of footwall, DDH 76-6, 467.7 ft to 468 ft.

3 - MZ-3, grab sample of pyritic quartzite, cliff showing area

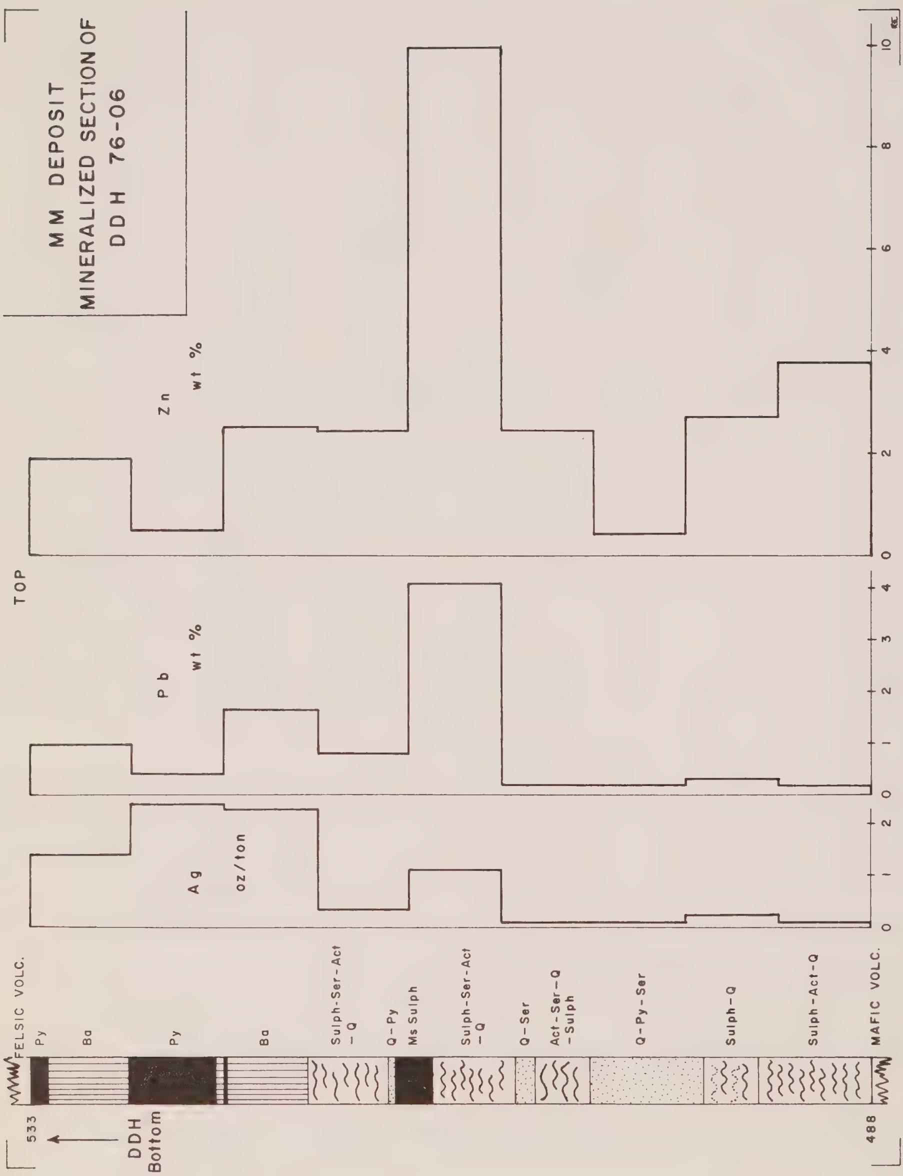
4 - MZ-1, grab sample of massive sulphide from cliff showing

5 - MZ-2, grab sample of barite horizon, cliff showing area

6 - MZ-7, split core sample of hangingwall, DDH 76-6, 541.5 ft. to 541.75 ft.

7 - MZ-4, split core sample of hangingwall, DDH 76-6, 536 ft. to 536.5 ft.

Analysts - Bondar-Clegg and Company Limited, Vancouver, B.C.


MM DEPOSIT
MINERALIZED SECTION OF
DDH 76-06
TOP
Ag
oz/ton
Pb
wt %
Zn
wt %
533
DDH
Bottom
488
FELSIC VOLC.
Py
Ba
Py
Ba
Sulph-Ser-Act
-Q
Q-Py
Ms Sulph
Sulph-Ser-Act
-Q
Q-Ser
Act-Ser-Q
-Sulph
Q-Py-Ser
Sulph-Q
Sulph-Act-Q
MAFIC VOLC.

Mineralized Zone

Lithology

The portion of the mineralized zone studied is 13.5 metres thick. It consists of sulphide-silicate gneiss, quartzite, massive sulphide, barite and massive pyrite units.

The sulphide-silicate gneiss consists of alternating layers of sulphides (varying amounts of sphalerite-pyrrhotite-pyrite with rare chalcopyrite) and silicates (varying amounts of quartz, actinolite, sericite). It accounts for about half of the mineralized zone and occurs intermittently throughout the lower 2/3 of the zone.

The quartzite consists of layers of quartz, pyrite, rare sphalerite and galena alternating with quartz and sericite and locally, it contains no sulphides at all.

The 0.6 metre thick massive sulphide unit occurs in the middle of the mineralized zone and it consists of massive to poorly layered, fine- to medium-grained sulphides forming up to 90 per cent of the rock, the remainder being andalusite (blocky shaped porphyroblasts), quartz and sericite.

Two barite units occur in the upper portion of the mineralized zone. They are each about 1.5 metres thick and they consist of fine-grained, poorly layered, sucrose-textured pale grey barite in layers about 5 mm thick alternating with thinner pyrite-rich layers which form from 10 to 40 per cent of the rock. Locally, the barite is massive and contains disseminated pyrite. Galena occurs as very minor thin layers and as disseminated grains throughout the units.

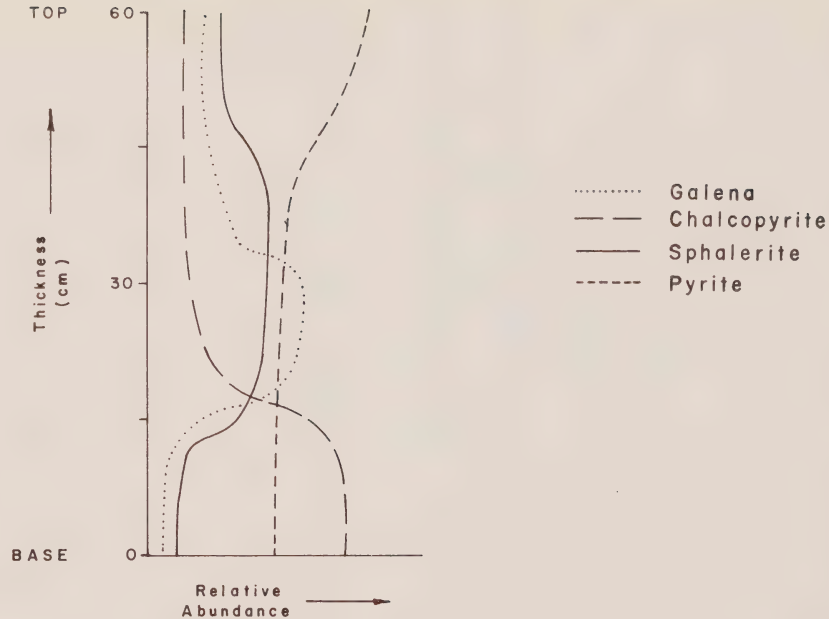
The massive pyrite units alternate with the barite in the upper portion of the mineralized zone and are the topmost unit in which sulphides are concentrated. They consist of fine-grained, massive to poorly layered pyrite with dark grey, coarsely crystalline irregular inclusions of calcite 3 mm to more than 10 cm in size and ranging from 7 to 30 per cent in abundance.

Metal Zonation

The 5 foot assay intervals correspond closely to the different rock units and enable comparisons to be made between lithology and metal content.

Silver and lead maintain low concentrations in the lower half of the deposit and sharply increase in concentration with the onset of the massive sulphide zone to 1.2 oz/ton and 4.2 wt%. This high concentration is reduced in the overlying sulphide-silicate gneiss and quartz-pyrite beds. In the upper portion of the mineralized zone, silver and lead are concentrated in the two barite-rich units. The silver/lead ratio undergoes a drastic change in the massive pyrite between the two barite units, lead low and silver high, indicating that the galena is locally richer in silver, and/or that a large portion of the silver is included in pyrite or that an undetected silver-bearing mineral is present.

Zinc maintains a relatively constant concentration in the sulphide-silicate gneiss units and barite units ranging from 1.9 to 3.8 wt%. Copper is very low in these units, averaging about 0.05 wt%, and is only moderately higher in the basal sulphide-silicate gneiss at 0.17 wt%. Concentrations of 10 wt% zinc and 0.4 wt% copper are attained in the assay interval that includes the massive sulphide zone. Both zinc and copper are at their lowest



M M Deposit: Schematic graph of mineral zonation in massive sulphide unit

7

concentration in the barite enclosed massive pyrite unit, 0.51 wt% and 0.03 wt% respectively.

Barium is concentrated as barite in the upper portion of the deposit and occurs in negligible amounts throughout the middle and lower portions. Iron maintains a moderate concentration throughout most of the section and has a sharp increase in concentration in the massive sulphide and pyrite units in the middle to upper portion. Sulphur is similarly low to moderate throughout most of the section, but shows a sharp increase in the upper half where it forms massive sulphides and sulphates. Silicon is concentrated in moderate amounts in the lower to middle portion of the section as silicates and is sharply enriched in the quartzite units and almost completely absent in the upper portion.

Extreme metal zonation occurs within the massive sulphide zone itself. The lower 15 cm are copper-rich, the next 15 cm lead-rich and the upper 30 cm iron-rich, with zinc high throughout.

ORIGIN

Using the premetamorphic lithology as a guide to the formation of deposit, a progressive sequence of several similar cycles was discerned:

BASE - Intermediate metavolcanic with thin quartz vein stockwork

1) sulphide-bearing felsic tuff to pyritic chert
2) sulphide-bearing felsic tuff to chert
3) sulphide-bearing felsic tuff to sulphide facies iron formation (metal enriched) to pyritic chert
4) sulphide-bearing felsic tuff to baritic exhalite
5) pyritic iron formation to baritic exhalite
6) pyritic iron formation

TOP - Felsic tuff, breccia.

A volcanogenic origin is indicated by the following features:

- The stratabound nature of the mineralized zones occurring as lenses within a volcanic sequence

- Stratiform character of the mineralized zone interlayered with felsic tuff and exhalative sediments

- presence of relict colloform pyrite in footwall intermediate tuff

- metal and mineral zonation within the mineralized zone itself and also within the thinner massive sulphide interval

- presence of quartz veining in the footwall rocks, i.e. probable siliceous alteration

- distinct compositional difference between the intermediate footwall and felsic hangingwall rocks

- similar mineralized exhalative horizons throughout the rest of the volcanic belt

- the presence of barium enriched volcanic rocks that provide a barium source for the exhalative barite horizons

A model of origin for the deposit is necessarily speculative, but at this preliminary stage, two classes of stratiform mineralization are proposed for this area, both related to exhalative centres. The first type is local (proximal) and consists of more massive and thicker layered sulphide units interbedded with the regional clastic and exhalite horizons. The second type of mineralization is regional (distal) in extent and consists of barite and chert horizons with minor to negligible amounts of disseminated and/or thinly layered sulphide (mainly pyrite).

Other Stratabound showings

The BNOB (#2) and CHZERPNOUGH (#3) claims cover two other stratabound showings, each consisting of a barite unit within which layered galena and pyrite occur. Possibly, the barite horizon at these two showings is correlative to the one at the MM deposit.

The MAT claims (#6) cover ground formerly held under the M.C. claims by the Quiet Lake Syndicate in 1966. In turn, the ground had previously been held by Conwest Explorations as the BOX group. To date, only limited trenching and geochemical soil sampling has been done. The main showing consists of a five foot section of massive galena within a sequence of graphitic slate and quartz-eye tuff. Surrounding the galena is a zone of pyrite which occurs as fine-grained disseminations and as semi-massive lenses. In addition, scattered veinlets of medium- to coarse-grained galena occur within an area about 75 feet long along the creek walls (see MAT claims, this publication). Botryoidal pyrite is reported to occur near the showing and this suggests that at least some of the mineralization is syngenetic and probably stratabound.

The GULL claims (#7) adjoin the MAT claims to the south and mineralization on the property consists of galena and minor sphalerite in veinlets and clots within reddish-brown felsic volcanics. A grab sample was reported to assay 6.2% Pb, 0.70% Zn, and 1.8 oz Ag/ton (Sinclair et al, 1976).

The CPA claims (#13) are 8 km east of the MM deposit and cover three large gossans in felsic metavolcanic rocks. The gossans appear to be stratabound and are due to oxidation of minor pyrite (Craig and Milner, 1975).

The JOE claims (#8) are located 20 km east of McNeil Lake on ground formerly staked as the FH group. Mineralization consists of a conformable lens of massive sulphides, mainly pyrite and pyrrhotite enclosed within a quartzite horizon (Archer-Cathro N.C.M.I.). The lens is up to 4 feet wide and has been traced for a distance of 3,700 feet. A grab sample assayed 7.3% Zn, 3% Pb, 1.1% Ag and trace Au.

Vein Showings

Vein type mineralization that may be related to hypabyssal syenite plugs occurs in Mississippian and older rocks in the area. The COOT claims (#4) cover ground formerly held as the CONE claims by Pelly Mountains Syndicate (Green and Godwin, 1964). The main showing consists of massive pyrrhotite, pyrite and galena described by A. Aho in Green and Godwin, 1964 p. 42 as "a sheet or lens-like mass that is up to 10 feet thick and possibly as much as 80 feet long". A grab sample assayed 0.02 oz Au/ton, 26.7 Ag/ton, 79.0 % Pb and 0.2% Zn. In addition, A. Aho reported four other showings of much smaller size and similar mineralogy in the nearby area. From the vague description of this property, it is difficult to determine whether the mineralization is stratabound or not, but the very high lead assay suggests a vein-type occurrence.

The Canol Mines Limited property (#5) is 4 km west of Seagull Creek and consists of veins of quartz, siderite and galena in dolomite, graphitic and phyllitic sedimentary rocks (Findlay, 1969). The host rocks are assigned by D. Tempelman-Kluit (1977) to a platformal carbonate facies of the Road River Formation and are Silurian in age.

Properties # 9, 10 and 11 are located west of the Ketza River and consist of argentiferous galena in veins and stratabound bodies within Mississippian volcanics and Lower Paleozoic carbonates and shale (Findlay, 1969).

The KEY showings (#9) on Cache Creek consist of both vein and stratabound types (Findlay, 1967, pp. 56-58). The veins are reported to consist of quartz and siderite with variable amounts of galena, pyrite and sphalerite and are emplaced within quartzite, quartzitic schists and phyllites and argillaceous rocks containing graphitic layers of probable Mississippian or earlier age. Stratabound mineralization has been described as thin, discontinuous stringers and disseminations of pyrite, pyrrhotite and galena conformable to schistosity and bedding planes.

The F-2 and F-3 showings (#10) are 0.8 km apart and consist of vein type quartz-pyrite-galena mineralization (Findlay, 1967, pp. 56-58) emplaced within quartzite, graphitic argillite and argillaceous schists.

The A-1 showing (#11) consists of a vein of galena and siderite emplaced within limestone, sericitic phyllite and graphitic argillite containing local quartz bands and lenses (Findlay, 1969, pp. 75-76).

The copper showing on the BELL Group (now lapsed) (#12) were formerly considered to be within the Mississippian volcanics. However, recent mapping by D. Tempelman-Kluit (1977) has shown the host rocks to be Cambro-Ordovician mafic volcanics. The mineralization consists of veinlets of bornite, chalcocite, covellite and chalcopyrite and calcite reported to be associated with shear zones (Ogilvy and Tredger, 1970).

ACKNOWLEDGMENTS

The author wishes to acknowledge the cooperation of Cyprus Anvil Mining Corporation, especially P. Dean for providing access to confidential company data and drill core. In addition, D. Tempelman-Kluit of the Geological Survey of Canada provided rock specimens and informative discussions.

MAYO MINING DISTRICT

Uranium-Copper Mineralization and Associated Breccia Bodies in the Wind-Bonnet Plume River Area, Yukon

by J.A. Morin

INTRODUCTION

During the summer of 1976, prospecting and mining exploration activity in the Wind-Bonnet Plume River area was concentrated on uranium-copper mineralization associated with breccia bodies in Lower Proterozoic rocks. The uranium mineralization was first noticed by Archer-Cathro geologists in 1974 on the IGOR property which had been staked for copper. During the following summer, Archer-Cathro's Wernecke Joint Venture conducted a low profile intensive prospecting program for uranium mineralization.

In January 1976, a short information release concerning uranium mineralization in the Wind River area was published in the G.S.C. Report of Activities (Blusson, 1976). This release essentially marked the moment at which uranium mineralization in northern Yukon became public knowledge. During summer 1976, programs of exploration and prospecting for uranium were maintained by the following companies in the Wind-Bonnet Plume River area: Archer-Cathro, Mountaineer Mines, Urangesellschaft, Noranda, Prism Resources. Archer-Cathro's Wernecke Joint Venture optioned their uranium properties to Eldorado Nuclear and in addition to detailed property work conducted diamond drilling on the BOND, PTERD and MST claim groups.

In addition, the Geological Survey of Canada sponsored several projects in the area. A geochemical survey was undertaken over several sub-areas within the Wind-Bonnet Plume River area: 106 E 2, 106 E 4, 106 D 14, 15, 106 D 10, 106 D 13. Water, stream sediment and rock samples were taken and analytical results for U, F and pH in stream waters were released in G.S.C. Open File Report 388 (Goodfellow and Jonasson, 1976). The analytical results outlined some of the known uranium occurrences and they were further reported on in G.S.C. Report of Activities (Goodfellow et al, 1976, pp. 237-240). S.L. Blusson re-evaluated the regional geology and stratigraphy of the Ogilvie Mountains and R.T. Bell and G. Delaney studied the stratigraphy of the Proterozoic rocks with special reference to the uranium occurrences (Bell and Delaney, 1977). Also, P. Laznicka and two students from the University of Manitoba studied the stratigraphy and economic geology of the Lower Proterozoic in the area of the Dolores Creek copper-cobalt occurrences (Laznicka, 1977).

REGIONAL GEOLOGY

Portions of the Lower Proterozoic in the Wind-Bonnet Plume River area have been mapped by several geologists of the Geological Survey of Canada, notably Norris (1975), Blusson (1974) and Green (1972). The mapping has shown the distribution of Lower Proterozoic or Helikian rocks to trend in an east-west direction in the Dawson and Larsen Creek areas and north-south in the Nash Creek-Bonnet Plume River-Wind River area (see accompanying map). They are locally overlain by Hadrynian clastics and carbonates of the 'Grit Unit' or by Cambrian carbonates and their base is not exposed. The lower portion of these rocks has been termed Unit 1 by Green (1972), Unit HO by Norris (1975) and Unit Hs, Hsc by Blusson (1974). It consists of "dark shale and argillite, with some siltstone to fine-grained quartzite, and very minor limestone" (Green, 1972, p. 14). Minor metavolcanic rocks are also present.

LEGEND

CLASTIC ROCKS OF HELIKIAN AGE: ARGILLITE, QUARTZITE

MINERAL OCCURRENCE: COPPER, URANIUM IRON

SCALE IN KM.
0 5 10 15

DISTRIBUTION OF HELIKIAN CLASTIC ROCKS AND ASSOCIATED MINERALIZATION IN THE BONNET PLUME RIVER AREA

1

(AFTER GREEN 1972, BLUSSON 1974, NORRIS 1975.)

LB

MINERAL OCCURRENCES

1) GREMLIN - Cu - chalcopyrite and pyrite as clumps in breccia matrix and as disseminated grains in chert;

2) WERNECKE - U - disseminated brannerite within felsic volcanics;

3) IGOR - Cu, U - chalcopyrite, hematite, magnetite and barite in pods within bleached siltstone adjacent to intrusive breccia (Sinclair et al, 1976);

4) GNUCKLE, Slats Creek - U - brannerite locally concentrated in fractures and shear zones in intrusive breccia;

5) Slab Mountain - Cu, U - minor chalcopyrite and uranium mineralization locally disseminated within intrusive breccia (Sinclair and Gilbert, 1975; Bell and Delaney, 1977);

6) BROMADROSIS - U - widely disseminated brannerite within pink siliceous calc silicate country rock peripheral to the intrusive breccia at Slab Mountain;

7) PTERD - U - pitchblende with minor pyrite and chalcopyrite surrounding and filling micro-fractures in breccia clasts;

8) Bonnet Plume River Mines Ltd.- Cu - chalcopyrite and cobaltite within veinlets and pods and disseminated in altered country rock peripheral to syenite stock and intrusive breccia (Laznicka, 1977);

9) Pacific Giant Steel Ores Ltd. - Fe - hematite as breccia matrix and pods within breccia and adjacent country rocks (Green, 1972);

10) BOND - U - uranium mineralization and minor magnetite locally disseminated within intrusive breccia and also in veins associated with siderite-quartz-barite-chalcopyrite-pyrite-pyrrhotite;

11) BOZO - U - uranium mineralization with associated pyrite, marcasite, magnetite, barite and chalcopyrite disseminated in brecciated volcanics (Sinclair et al, 1976);

12) OTIS - U - brannerite locally disseminated within fault breccia zone and associated fractures in metavolcanic country rocks intruded by breccia bodies;

13) FACE - U - brannerite concentrated along fractures within a siliceous border phase of an intrusive breccia;

14) TET - Cu - chalcopyrite, bornite, hematite and magnetite locally disseminated within quartzite and minor shale;

15) LOON.- U - brannerite (?) locally disseminated within bleached siltstone.

Overlying the lower argillite and quartzite is a thick succession of orange weathering dolomite referred to as Unit 2 by Green (1972), H1 by Norris (1975) and Hc by Blusson (1974). To date, most of the U-Cu mineralization discovered is restricted to the lower argillite-quartzite succession, though studies presently being undertaken by Blusson, Bell, Delaney and Laznicka will no doubt modify this preliminary stratigraphy.

GEOLOGY OF BRECCIA BODIES

In most cases, the Cu-U mineralization occurs within or nearby certain types of breccia bodies in Helikian rocks. They can be subdivided on the basis of their dominant clast material into chaotic polymictic breccias characterized by either clasts of sedimentary rocks or of volcanic rocks. These breccias have a common origin and the differences between them is mainly a function of the different country rocks that they have intruded.

Chaotic polymictic breccia of sedimentary material is common to the following localities: Kiwi Lake, Slab Mountain, Quartet Mountain, Slats Creek. Most of the breccias discovered to date are in the Wind-Bonnet Plume River area, though Blusson has noted occurrences of them as far west as the Coal Creek Dome area, north of Dawson (Personal Communication, 1976).

Morphology

They occur as pipelike necks with lateral apophyses and as mushroom shaped bodies in the order of several hundred metres to several kilometres in areal and vertical extent. They are restricted mainly to the lowermost Helikian rocks exposed which consist of argillite, quartzite and metavolcanic rocks (Unit 1 of Green, 1972), though they have also been described by S.L. Blusson (Personal Communication, 1976) from the upper Helikian orange dolomite (Unit 2 of Green, 1972). Some of the breccias, especially those with a high carbonate content, weather out into spires or pinnacles several tens of metres high which form imposing hoodoo-like topographic features that are easy to recognize from a distance.

Composition

The breccias are massive and lithologically complex. Clasts range in size from a centimetre to several tens of metres and are made up of several sedimentary rock types, but dominantly argillite and siltstone. The lithology of the immediate country rock is reflected by the lithology of the clasts, which are typically angular and set within a fine grained matrix made up of comminuted clast material ± carbonate, ± feldspar, ± iron oxides, ± quartz, ± sericite.

Volcanic clasts in breccia are commonly angular fragments of felsic volcanics, argillite and tuff enclosed within a fine grained felsic matrix. Breccia with this type of clast material occurs at Bond Creek and north of Dolores Creek. Thin beds of banded hematite-jasper iron formation and argillite or tuff also occur in association with the breccias.

At Bond Creek, the breccia is intrusive into a sequence of argillite, and within the breccia, veinlets of siderite, barite and quartz, minor chalcopyrite and locally minor uranium mineralization occur in fractures.

Alteration

Extensive alteration is one of the main characteristics of the breccia bodies. It includes hematization, chloritization and carbonatization.

Iron oxides (hematite, magnetite) are widely disseminated throughout the breccias in minor amounts. Within the breccias and nearby country rocks, irregular podlike zones of pink to red felsic rock occur which are commonly brecciated, infilled with a coarser grained matrix and laced with irregular veinlets. In thin section, the pink clasts are seen to consist of very fine grained granoblastic quartzo-feldspathic material with rare epidote and variable amounts of evenly disseminated magnetite (partially altered to hematite) or just hematite distributed within the clast as a thin film along intergranular surfaces. Locally, 1 mm porphyroblast of euhedral carbonates such as calcite, siderite and ankerite are disseminated within the clasts. Commonly, the clasts are surrounded by a thin rind of hematite and chlorite.

The matrix typically consists of medium to coarse grained hypidiomorphic equigranular quartz, plagioclase and calcite with minor chlorite and muscovite. Also within the matrix, fine to coarse grained anhedral irregular clumps of iron and copper oxides and sulphides are present, sometimes with associated minor uranium mineralization.

The veinlets in the alteration zones transect both the matrix and clasts and consist of iron oxides or of quartz-feldspar-carbonate.

The above alteration minerals locally occur in much greater concentration as veins or pods up to several metres wide and several tens of metres long. These occurrences provide spectacular monominerallic showings such as those of coarsely crystalline pyrite, siderite and chalcopyrite on the GREMLIN property and barite and hematite on the IGOR property. To date, nowhere in this area have monomineralic uranium mineral showings equal to those of iron, copper and barium been discovered.

Contact Metamorphism

At some localities, the country rock that is host to the breccia is metamorphosed to a spotted hornfels with chloritoid porphyroblasts and/or biotite schist. The aureole of spotted hornfels at Kiwi Lake on the GREMLIN claim group extends about one hundred feet within the argillite. Prismatic porphyroblasts of chloritoid up to 2 cm in length occur randomly oriented throughout the meta-argillite. Chloritoid also forms at the contact of a breccia body with argillite on Slats Creek (GNUCKLES). According to Winkler (1974), the formation of chloritoid indicates temperatures in the order of 500°C.

Limited areas of diorite occur associated with the breccia bodies, e.g. Slats Creek, Bear River, Dolores Creek, Slab Mountain. Commonly the diorite is medium grained equigranular and extensively altered to hematite, chlorite and epidote. At the Slats Creek occurrence, a 5 m wide body of diorite is bounded on either side by a 1 m wide alteration fringe of chlorite which separates the diorite from the breccia. This relationship suggest that the breccia may be igneous in origin and part of a diorite diatreme. However, the body of diorite has alternatively been interpreted by others as a clast within the breccia and by Laznicka in the Dolores Creek area, as contemporary to slightly earlier intrusive dykes (Laznicka, 1977).

Bleaching is an important type of contact metamorphism that occurs locally in country rock peripheral to the breccia on the PTERD and IGOR

properties and probably on most others. It consists of iron depletion and silica enrichment and is most noticeable in Unit 1 quartzite. In this process, thinly layered grey siltstone with minor disseminated magnetite (5-10%) and major quartz-feldspar-sericite is transformed in proximity of the breccia to a creamy white or pale yellowish green thinly layered siliceous rock consisting of alternating layers of flaky sericite and clastic grains of quartz and feldspar with tiny pseudomorphic relics of limonite after magnetite. Bleached siltstone has a very close resemblance to flow banded rhyolite.

URANIUM MINERALIZATION

The mode of uranium mineralization is varied and difficult to accurately describe. However, the showings known to the author can be broken up into two basic types:

1) disseminated
2) fracture filling

The first type consists of fine euhedral grains of brannerite with minor thorite and uranothorite locally disseminated throughout pods of patchy red feldspathic alteration in the host rock, commonly quartzite. Pale to brick red hematite haloes about 1 cm in diameter surround the brannerite grains. This type occurs on the LOON and WERNECKE claim groups in the Quartet Lakes area. In thin section, the haloes consist of dusty hairlike stringers of hematite disseminated within the fine grained quartzofeldspathic matrix around grains of sphene and brannerite that are enclosed in thin veinlets of quartz-feldspar. Some of the hematite and brannerite (?) is distributed in a dendritic pattern adjacent to the narrow felsic veinlets. In addition, at some localities, uranium mineralization occurs disseminated within the chaotic breccias - both matrix and clast, commonly in association with coarsely crystalline chalcopyrite, barite, siderite, pyrite and hematite-magnetite, e.g. the URSUS and IGOR claim groups. On the GREMLIN claim group, a similar mineral assemblage occurs with substantially more copper but no uranium.

The second type of mineralization consists of pitchblende with minor brannerite along thin fractures and shear zones, primarily in the volcanic breccias. Secondary minerals such as green torbernite (?), yellow autunite (?) (both visual identification) and iriginite, and orange vandendriesscheite are also developed. Examples of this type are present on the PTERD and BOND claim groups.

GEOCHEMISTRY

The uranium-breccia association is characterized by an anomalous concentration of many elements. From consideration of mineral assemblages and spectrographic analyses of uranium mineralized rocks, it is evident that the following elements maintain consistent high concentrations: U, Pb, Mn, Ti, C, Fe, S and Si. In addition, the following elements occur in sporadically high concentrations: Au, Ba, Th, Co, Cu, Nb, RE, As, Mo, Ni and Zr. One interesting feature is the absence of Th in the breccias of volcanic material and its presence in the chaotic breccias of sedimentary material. The presence of brannerite accounts for the high Ti and RE content. Sulphur is present as sulphide combined with Fe, Cu, Co, As, Mo, Ni and/or as sulphate with Ba. C is present as carbonate and Si with silica. The Pb can be accounted for by radioactive disintegration of U and Th. Iron and manganese are accounted for by the presence of siderite and ankerite.

Barite is important in prospecting because it indicates that sulphates are present and stable in the environment. For example, a gossan may develop over a U-Ba mineralized zone and result in the surface leaching of U, whereas radium would probably not migrate far and would become fixed with Ba in radiobarite, (Ba, Ra) SO_4. Thus, the presence of a poorly mineralized radioactive gossan associated with barite indicates the possibility of uranium enrichment below the zone of leaching and oxidation.

In his text on exploration geochemistry, Levinson (1974) mentions the following elements as common pathfinders for vein type uranium deposits: Cu, Bi, As, Co, Mo, Ni. However, rock, soil and stream sediment geochemical exploration for the breccia type of uranium occurrence should be guided by its own peculiar mineralogy and potential pathfinder elements selected in this way include: Ba, Mn, Ti, Pb, Mo and Cu.

ORIGIN

Any speculation regarding the origin of the breccia bodies and associated mineralization has to consider the following criteria:

1) Spatial association of copper, cobalt mineralization with uranium in some of the breccia bodies and their host rocks;
2) alteration mineral assemblages indicate temperatures up to about 500° C;
3) bleaching of country rocks around some of the breccia bodies involving addition of silica and iron depletion;
4) textures indicative of closely contemporaneous crystallization of chalcopyrite, pyrite, calcite, siderite;
5) breccia fragments are commonly not too far removed from their original stratigraphic level;
6) high carbonate, silica, iron and sulphur content in breccia matrix;
7) uranium-copper mineralization associated with all types of breccia, independent of the country rock and clast material;
8) lack of major and accessory igneous minerals;
9) presence of comminuted clast material in matrix;

SUGGESTIONS TO PROSPECTORS

All of the breccia associated uranium mineralization discovered to date lies within Helikian rocks, where obviously, any further prospecting should concentrate. It is perhaps ironical that the first mineralization discovered to be associated with these breccia bodies was specular hematite on the old Pacific Giant Steel Ores Ltd. property situated just north of the Bear River (Green, 1972).

Prospecting guides for this type of mineralization in the area are several: 1) anomalous concentrations of magnetite-hematite, chalcopyrite, barite, siderite-ankerite, pyrite; 2) areas of alteration such as hematite, malachite, limonite, bleaching; 3) areas of anomalous radioactivity.

ACKNOWLEDGMENTS

Many of the ideas developed in this report were first discussed in the field with the government and exploration geologists working in the area, notably A. Archer, R.T. Bell, S.L. Blusson and C. Riley.

United Keno Hill Mines Limited

Silver, Lead, Zinc, Cadmium
105 M 13, 14
(about 63°55'N, 135°29'W)

Selected References: Boyle (1957; 1965; 1968); Green and McTaggart (1960); Green (1966, pp. 10-17) Gleeson (1966; 1967); Findlay (1967, pp. 18-21; 1969a, pp. 20-24; 1969b, pp. 10-12); Tempelman-Kluit (1970); Craig and Laporte (1972, pp. 11-13); Craig and Milner (1975, pp. 28-29); Sinclair and Gilbert (1975, pp. 9-11); Sinclair et al (1975, pp. 10-12; 1976, pp. 23-25).

Claims: 493 claims

Location and Access:

The properties situated mainly on Keno Hill and Galena Hill, are readily accessible by an all-weather road from Mayo, 52 km to the south. Ore concentrates are trucked 477 km to Whitehorse, then transferred to the White Pass and Yukon Route and shipped by rail to Skagway.

History:

Silver-bearing galena was first discovered on Galena Creek in 1906 and small tonnages of high-grade ore were shipped from 1913 to 1919. Following the discovery of the No. 9 vein by Louis Beauvette in 1919, which resulted in a stampede, numerous important prospects were located. Since then there has been almost continuous production from veins in the area, except for the period 1942 to 1946.

Description:

The area is underlain by graphitic and sericitic schist, phyllite and quartzite which have been divided into three units: a lower schist, a central quartzite, and an upper schist (Units 1, 2 and 3, Boyle, 1965). Formerly considered to be part of the Precambrian Yukon Group metasediments, the lower schist and central quartzite are now considered to be Jurassic and Lower Cretaceous respectively, based on stratigraphic correlations (Tempelman-Kluit, 1970). The age of the upper schist is uncertain. Metadiorite and metagabbro, locally referred to as "greenstone", occurs as conformable lenses and sills in the lower schist and central quartzite. Granitic stocks of Cretaceous age outcrop northwest and southeast of Galena and Keno Hills and related quartz-feldspar porphyry dikes are present locally throughout the area.

The metasediments form the southern limb of a large, open anticline and dip gently to the southeast. There are two systems of steeply-dipping faults, one trending northeast and the other northwest.

The ore deposits consist of veins developed in dilatant zones in northeast-trending faults cutting thick-bedded quartzite and greenstone. The principal ore minerals are galena, sphalerite and freibergite. Gangue minerals include siderite and pyrite.

Current Work and Results:

In 1976, United Keno Hill Mines Limited operated five mines in the Keno-Galena Hills area with a total production of 75,515 tons of ore averaging 35.49 ounces silver per ton, 4.02 per cent lead and 1.17 per cent zinc. Development work for 1976 is summarized below:

	Elsa	Husky	No Cash	Dixie	Keno	Total
Production (tons)	8,745	34,333	10,604	1,933	14,890	70,505
Drifts & crosscuts (ft)	153	1,148	324	179	593	2,397
Raises (ft)	255	305	93	8	221	882
Sub drifts (ft)	186	127	333	-	62	708
Diamond drilling (ft)	-	3,175	1,590	-	-	4,765
Longhole drilling (ft)	344	2,040	1,032	60	426	3,902

At the Elsa Mine, a raise was driven above the 200 level on the No. 2 vein in response to high grade values determined by the overburden drilling exploration program. A potential block was determined whose lower extensions were further investigated in early 1977. In addition, a drift on the 400 level driven to explore test hole values encountered ore for a length of 52 feet.

At the Husky Mine, a cross cut on the 375 level intersected ore over 11.2 feet and a raise was driven from the 225 level for access and for exploration. High grade material was encountered over a length of 68 feet.

A raise was driven from the 225 level at the No Cash Mine for six lifts and ore grade material was encountered over a distance of 42 feet. Another raise in the mine encountered high grade material over a length of 49 feet. No additional ore shoots were developed at the Dixie Mine. At the Keno Mine, two raises were driven along the 18 vein which encountered ore over lengths of 133 feet and 112 feet.

In addition, 138 tons of ore were produced from the Black Cap Mine, 4,455 tons from the Calumet dump and 417 tons from the Silver King tailings.

No significant ore veins were disclosed by the overburden drilling program on Galena, Keno and Sourdough Hills. Prospecting and some overburden drilling were completed in the Silver Basin area on the east flank of Keno Hill. Drilling on the KPO-LEO option was curtailed by depth of overburden beyond the capability of the drill.

The following summary of operations in 1974, 1975 and 1976 is taken from annual reports of the company:

	1976	1975	1974
Tons Milled	75,515	90,860	93,232
Daily Average (tons)	239*	249	255.4
Mill Heads:			
Silver (oz/ton)	35.49	34.96	37.93
Lead (%)	4.02	4.03	4.22
Zinc (%)	1.17	1.15	1.15
Metal Production:			
Silver (oz/ton)	2,369,770	2,917,920	3,237,205
Lead (lb)	4,909,101	6,407,368	6,737,719
Zinc (lb)	621,945	620,763	545,357
Cadmium (lb)	8,394	8,758	7,330
Metal Sales:	$12,070,299	$15,696,435	$17,480,540
Ore Reserves (tons)	100,977	121,737	105,632
Silver (oz/tons)	41.2	39.3	44.0
Lead (%)	4.8	4.7	4.9
Zinc (%)	1.3	1.1	1.2

*Adjusted for strike of 49 calendar days.


LOCATION MAP, KENO HILL-
GALENA HILL AREA, 105M 13,14
LEGEND
(10) Mine with 1976 percentage of total production indicated, eg 10%
Townsite
All weather road
2
SILVER BASIN
KENO HILL
18 VEIN (19.7)
BLACK CAP (0.2)
KENO HILL
SOURDOUGH HILL
FT. 0 2000 4000 8000 FT.
METRES 0 1000 2000 METRES
CALUMET DUMP (5.9)
NO CASH (14.0)
DIXIE (2.6)
ELSA (11.5)
HUSKY (45.5)
GALENA HILL

PLATA
Cyprus Anvil Mining Corporation

Silver, Lead, Zinc
105 N 9, 105 O 12
(63°35'N, 132°02'W)

References: Blusson and Tempelman-Kluit (1970, pp. 29-32); Blusson (1974a); Sinclair and Gilbert (1975, pp. 17-19); Sinclair *et al* (1975).

Claims: PLATA 1-232, 241-258, 267-288; INCA 1-44

Location and Access:

The claim groups are situated in the Bostock Range of the Hess Mountains roughly halfway between the Rogue and Hess Rivers. Access is provided by fixed wing aircraft from Ross River, 174 km to the south, to an airstrip 10 km south of the property. A tote road between the airstrip and the property is unserviceable during the summer months due to its swampy location.

History:

The claims were staked in August and September 1972 and July 1974. The property was first examined late in 1972 by a program of hand trenching, geochemical and geophysical surveys and diamond drilling (six holes for a total footage of 1,315 feet). Work in 1973 and 1974 consisted mainly of bulldozer trenching.

Geochemical soil sampling was also carried out on the PLATA and INCA claims in 1974 and the samples were analyzed for silver and lead. Silver-lead anomalies were found to coincide very closely with known areas of near-surface mineralization and at least two additional zones of potential interest were outlined on the PLATA claims.

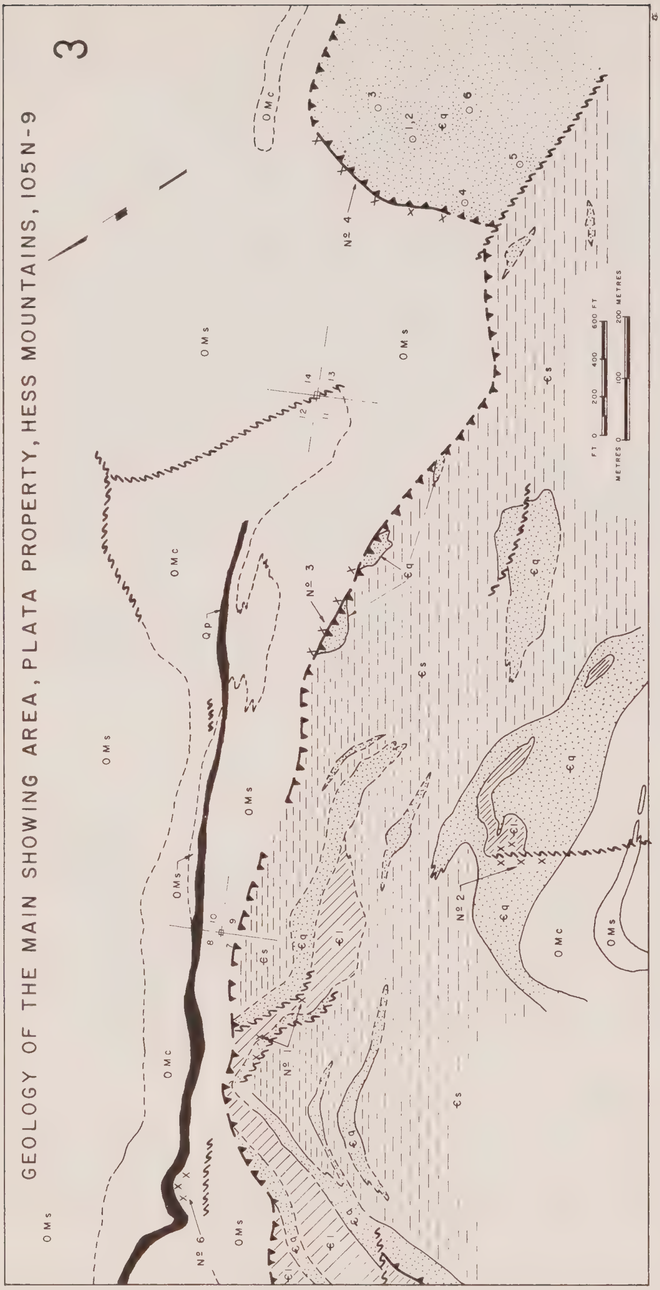
Description:

The property is underlain by interbedded shale and chert of Ordovician to Mississippian age unconformably overlying or in fault contact with Proterozoic maroon and green slate, quartzite and limestone (see accompanying map). A quartz porphyry dyke trending east-west is the only intrusive on the property. The sediments strike west to west-northwest and are isoclinally folded. The units are cut by a set of conjugate faults trending roughly northeast and northwest and displaced by a major thrust fault. The thrust fault contains low gold and silver values associated with a quartz gangue. Veins of high-grade argentiferous galena occur with siderite in northeast- and northwest-trending faults. In all, 42 separate showings have been discovered to date.

Current Work and Results:

During summer 1976, a bulk sampling program was undertaken by A. Harman and F. Lavoie to evaluate the profitability of small scale mining from this remote location. Approximately 100 tons of high-grade material was obtained by open cut methods from three vein zones (see accompanying map) and shipped to the smelter.

ZONE	BULK SAMPLE	APPROXIMATE GRADE
1	60 tons	280 oz Ag/ton, 70% Pb
2	25 tons	160 oz Ag/ton, 70% Pb
6	15 tons	200 oz Ag/ton, 70% Pb


GEOLOGY OF THE MAIN SHOWING AREA, PLATA PROPERTY, HESS MOUNTAINS, 105N-9
3
OMs
OMc
Qp
€s
€q
€l
Nº 1
Nº 2
Nº 3
Nº 4
Nº 6
FT 0 200 400 600 FT
METRES 0 100 200 METRES

LEGEND

TERTIARY	QP	Pale orange weathering, fine to medium grained, light tan quartz porphyry to aplite
ORDOVICIAN – MISSISSIPPIAN	OMs	Dark grey to black weathering, predominantly black, carbonaceous shale with minor graphitic chert, argillite and barite lenses
	OMc	Dark grey weathering, pale grey to black massive chert with minor intervals of shale
Unconformity		
CAMBRIAN AND OLDER	€s	Pale green and maroon phyllitic shale and slate
	€q	Pale brown to grey quartzite
	€l	Pale grey to dark bluish grey limestone

	Geological contact, defined, assumed
	Fault or shear zone
	Thrust fault, defined, assumed
X X X	Pb-Zn-Ag mineralization
⊙¹	Diamond drill hole

Geology after W. J. Roberts 1973

In Zone 1, the major mineralization consists of a lens of foliated galena-tetrahedrite measuring 15 m in length by a maximum thickness of 1.3 m. The lens is situated within a fault zone trending 015° and dipping 25° to the west that separates massive brown quartzite from overlying maroon and green slate.

Zone 2 is made up of two sections traced over a distance of 103 metres. The northern section is mainly siderite gangue with blebs and pods of galena and sphalerite replacing Proterozoic limestone and the southern section is largely fine- to medium-grained foliated galena and tetrahedrite as bands in siderite gangue within a shear zone. The southern section is 52 m long and contains 795 tons per vertical metre grading 35 per cent Pb and 84 oz Ag/ton. Further south, the zone disappears as the fault structure passes into overlying black chert and shale.

Zone 6 consists of massive blocks of high-grade galena-tetrahedrite float and galena-siderite-jarosite bearing fractures in highly sheared footwall black shale and chert.

Transportation played a crucial role in the economics of the operation, accounting for almost half the project cost. Mineralized material was transported by cat sloop to the PLATA airstrip prior to thawing winter road conditions and by helicopter (800 lb or 360 kg loads) later during the summer. It was then flown in 2,000 lb (850 kg) lots in a fixed wing aircraft to the Twin Creeks airstrip on the North Canol Road. The sample bags were than trucked in 8 ton (6.6 metric ton) loads, 500 km to Whitehorse. From Whitehorse, the sample bags were shipped by rail and ship to Vancouver and then by rail to the Asarco Smelting and Refining plant in East Helena, Montana.

Bulk sampling of the PLATA property was difficult due to several factors: the extremely short exploration season, the precipitous and unstable slopes, the impassable access road between the airstrip and camp and the cost of flying bulk samples from the PLATA airstrip to Twin Creeks. However, the venture did turn out to be economically profitable and further bulk sampling (excess of 300 tons) was recommended for the No. 2 zone to determine the economic feasibility of direct shipping lower grade galena-tetrahedrite mineralization.

JASON
Ogilvie Joint Venture

Zinc, Lead, Barite
105 O 1
(63°10'N, 130°10'W)

Reference: Blusson (1974a); Carne (1976).

Claims: JASON 1-82, 84, 85-136, 138-176, MIKE 1-2

Location and access:

The claims are located about 16 km southwest of Macmillan Pass, about 209 km east of Ross River along the North Canol Road. Access is by vehicle along the Canol Road or by wheeled fixed-wing aircraft to an airstrip immediately north of the claim group.

History:

The claims JASON 1-44 were recorded in August 1974 by Ogilvie Joint Venture, a consortium of Brinex, Mitsubishi and Ventures West. In July 1975, JASON 45-48 were recorded, as were also JASON 49-82, 84, 85-134, 141-160 in August 1975. JASON 135-136, 138-140 were recorded in March 1976; 161-176 in

November 1975 and MIKE 1-2 in June 1976. Property work conducted in 1975 led to exploratory diamond drilling of seven holes for a total of 2,100 feet in October 1975 (Carne, 1976).

Description:

The property is underlain by argillite of the Ordovician-Silurian Road River Formation and argillite, conglomerate, black shale and siltstone of Devono-Mississippian age. A horizon consisting of bedded and spotty barite with associated lead-zinc mineralization occurs within the black shale unit at the same stratigraphic horizon as on the adjacent TOM property to the east. A more detailed account of the geology and mineralization is given in Carne (1976).

Current Work and Results:

During summer 1976, detailed geological mapping (1 inch = 400 feet), geochemical soil sampling, geophysical and diamond drilling programs were conducted on the property. Soil samples were collected at 100 foot intervals along 24.7 miles of grid lines spaced 250 or 500 feet apart and analyzed for Pb, Zn, Ba. In addition, I.P., gravity and EM geophysical surveys were conducted. The diamond drilling program consisted of 6 holes with BQ core for a total footage of 2,885 feet. 8 holes with NQ core for a total footage of 3,810 feet and 1 hole with HQ core for a footage of 400 feet.

GARY
Ogilvie Joint Venture

Barite
105 O 1
(63°04'N, 130°13'W)

References: Blusson (1974a); Carne (1976).

Claims: GARY 1-38, 58, 63-75

Location and Access:

The claims straddle the North Canol Road about 24 km south-southwest of Macmillan Pass. Access is provided by vehicle on the North canol Road.

History:

The GARY 1-38 claims were staked in August 1974 to cover the probable extension of bedded barite that outcrops on the MOOSE claims. In 1974, a geochemical soil sampling program turned up some zinc anomalies. These anomalies were more accurately defined in 1975 by further soil sampling and a gravity survey. Additional prospecting located bedded barite on the north end of the property and claims GARY 58, 63-75 were staked and recorded in July 1975.

Description:

The area is largely covered by overburden, but the exposed outcrop indicates that clastic sedimentary rocks of the Road River and Besa River Formations underlie it. Carne (1976) provides a more detailed account of Besa River lithology. Stocks of Cretaceous granodiorite also occur in the area.

Mineralization consists of shale hosted bedded barite exposed in two showings (Gargantua and South Gargantua) in the northern part of the claim group. The barite bed is reported to range from 3 m to 18 m in thickness and is folded into a series of minor east-west folds such that the bed is exposed

several times along the dip slope. The barite is light grey in colour, finely interlaminated with argillite and apparently devoid of lead and zinc. Estimated tonnage of exposed barite is reported to be three million tons.

Current Work and Results:

During summer 1976, the claims were gologically mapped at a scale of 400 feet = 1 inch and geochemically soil sampled.

PETE — 105 O 1
Ogilvie Joint Venture — (63°00'N, 130°05'W)

Reference: Blusson (1974a).

Claims: PETE 1-32

Location and Access:

The property is located 166 km northeast of Ross River and 27 km south of Macmillan Pass. During summer 1976, access was provided by helicopter from the Macpass airstrip adjacent to the Canol Road, 21 km to the north.

History:

The claims were recorded in August, 1975.

Description:

The property is largely overburden covered, but on strike to the west, outcrops of bedded barite with minor amounts of lead and zinc mineralization occur.

Current Work and Results:

During summer 1976, gravity and geochemical soil sampling surveys were conducted over a grid of 10 line miles. Gravity measurements and soil samples were taken at 100 foot intervals along lines spaced either 500 or 1,000 feet apart. Coincident barium-zinc and gravity anomalies were determined in the northwest portion of the grid and diamond drilling was recommended for further work.

TEA — Barite
Welcome North Mines Limited — 105 O 2
(63°01'N, 130°36'W)

References: Blusson (1974a); Sinclair *et al* (1976); Carne (1976).

Claims: TEA 1-100

Location and Access:

The property is located 11 km west of Jeff Lake and is accessable by vehicle along a 12.5 km road leading north from Milepost 253.6 on the North Canol Road.

History:

The claims were recorded in August 1975 by Welcome North Mines Limited. They were subsequently optioned by J. Dodge and later transferred to Yukon

Barite Company Limited. In 1975, the property was geologically mapped and bulk sampled.

Description:

The property is underlain by the Besa River Formation of Upper Devonian age and the stratigraphic succession from base upwards consists of chert pebble conglomerate, siliceous pyritic shale, bedded barite, carbonaceous shale and quartzite. A much more detailed account is available in Carne (1976). The barite-rich horizon consists mainly of bedded barite with accessory interbeds of baritic limestone, witherite, limestone, chert and shale.

Current Work and Results:

During summer 1976, the TEA claims were subjected to further bulk sampling, geologically mapped at a scale of 1 inch = 200 feet and about 10,000 metric tons were stripped by bulldozer. A one lane truck haul road with turnouts was completed for 12.5 km from Milepost 253.6 on the North Canol Road to the property.

CATHY, LORRAINE, CHAS, KAM,
LES, WALT, FAT, CITY
Baroid of Canada Limited

Barite
105 O 7
(63°16'N, 130°34'W-
39'W)

Reference: Blusson (1974a); Sinclair et al (1976).

Claims: CATHY 1-10, LORRAINE 1-6. CHAS 1-5, KAM 1-6, LES, WALT, FAT and CITY

Location and Access:

The property is located about 170 km northeast of Ross River and 19 km miles west of the Yukon-NWT border. Access is provided by helicopter.

History:

The claims CATHY 1-6 and LORRAINE 1-6 were staked in February 1975 and KAM 1-2 LES, WALT FAT and CITY in July 1975. The following were recorded in August 1976: CATHY 7-10, KAM 3-6, CHAS 2-5. During 1975, preliminary geological and geochemical work were conducted.

Description:

The property is underlain by the Besa River Formation of Upper Devonian age which consists of black, noncalcareous shale interbedded with siltstone, limestone, chert pebble conglomerate and barite.

Current Work and Results:

During summer 1976, detailed geological mapping on the CATHY and CHAS claims and further sampling and metallurgical work was conducted.

PR
Welcome North Mines
(Arctic Red Joint Venture)

106 B 5
(64°28'N, 131°52'W)

Reference: Blusson (1974a).

Claims: PR 1-24

Location and Access:

The property is located near the Yukon-N.W.T. border, 16 km north of Bonnet Plume Lake. Access is provided by float equipped fixed-wing aircraft to an unnamed lake near the headwaters of the Snake River, just south of the claim group.

History:

The claims were recorded in September 1976.

Description:

The property is underlain by shale of the Besa River Formation. Zinc-lead-barite mineralized float and smithsonite cappings occur associated with several ground water seeps.

Current Work and Results:

During summer 1976, the property was subjected to reconnaissance geological mapping (1 in = 1/2 mile) and geochemical soil, silt and rock sampling. An area about 850 m x 600 m was determined to have an anomalously high geochemical response.

TARA
McIntyre Mines Limited

Zinc, Lead
106 C 2, 6, 7
(64°15'N, 132°55'W)

Reference: Blusson (1974a).

Claims: TARA 1-250

Location and Access:

The property is located on the east flank of Nadaleen Mountain, 12 miles south of the Bonnet Plume River. Access is provided by float plane from Mayo, 160 km to the southwest of Tara Lake (local name), a small lake on the east side of Nadaleen Mountain.

History:

TARA claims 1-24 were staked in June, 1975 as a result of follow-up prospecting and stream sampling after the discovery of an anomalous zinc stream sediment sample determined in a reconnaissance stream sediment geochemical program. The claim group was enlarged by the staking of TARA 25-250 in August 1975.

Description:

The property is underlain by carbonate and clastic rocks of Hadrynian to Devonian age. Stratigraphically lowermost is the Hadrynian "Grit Unit" which

is overlain by dolomite of the Hd unit (Blusson, 1974a). The Hd rocks have a conformable and gradual contact with overlying green and red shale of the "Sheepbed Formation". Overlying these units is a major unconformity capped by massive carbonates and minor interbedded shale of Ordovician to Devonian age.

The rocks are gently folded into a shallow dipping southwest plunging syncline. Attitudes near the fold axis are horizontal but gentle to moderate dips are encountered on the limbs of the syncline. Steeply dipping block faults form horst-graben type structures along the upper Hd contact with overlying shale. The faults terminate at the unconformity above the Sheepbed Formation and may have some relation to the occurrence of lead-zinc mineralization.

Three major mineralized showing areas occur within the Hd unit and one within the Hlsl unit. Coarse-grained galena mineralization locally occurs near the upper contact of grey white weathering crystalline dolomite of the Hd unit. In addition, pyrite, sphalerite and galena occur at lower levels of the Hd unit associated with zones of zebra breccia. Here, the host rock is fractured, dark grey black weathering dolomite. Within the lower Hlsl unit, coarse-grained galena and sphalerite occur in fractures and vugs in dolomitized and silicified intramicrite. Significant pyrite mineralization occurs within the Hd unit associated with zebra breccia dolomite.

Current Work and Results:

During summer 1975, detailed soil geochemical, geological mapping and diamond drilling programs were conducted. Over 1,500 soil samples were collected over 51 line miles of grid and analyzed for Cu, Pb, Zn, Ag. Grid lines were surveyed in by compass and chain and flagged at 100 foot stations. Geological mapping of the claim group was conducted at a scale of 1 inch = 1,000 feet with a larger scale in the showing areas. The diamond drilling program was conducted late in the season and consisted of 2,436 feet of BQWL core in three "BBS 1" holes and 243 feet of EXT core in five "Winkie" holes. Results of work on the property were considered encouraging by company geologists.

KIDD — 106 C 3, 105 N 14
McIntyre Mines Limited — (64°00'N, 133°10'W)

Reference: Blusson (1974a,b).

Claims: KIDD 1-36

Location and Access:

The property is located on the north bank of the Stewart River. Access is by helicopter from Mayo, 120 km to the west.

History:

The claims were staked to cover a gossan zone that was initially located from the air and gave an anomalously high geochemical zinc value. KIDD claims 1-4 were recorded in July 1975 and KIDD 5-36 in September 1975.

Description:

Rocks on the property are poorly exposed. They consist of Hadrynian "Grit Unit" which are unconformably overlain by silver weathering black carbonaceous shale of Devono-Mississippian age (Canol Formation?).

To date, no base metal sulphide mineralization has been observed on the property. However, a large gossan and limonite-siderite tufa occurs in the centre of KIDD #1 claim deposit and one grab sample of the tufa material assayed 17.5 per cent zinc.

Current Work and Results:

During summer 1976, detailed geological mapping, and geochemical soil, stream and seep silt sampling programs were conducted. Forty-five soil samples were collected on a grid with 500 foot line spacing (200 feet over gossan) at 200 foot intervals and analyzed for Pb, Zn, Ag, Cu. Stream silts and limonite-rich silt from seeps were collected and analyzed in total heavy metal field kits. A Winkie diamond drill hole was attempted but no core was recovered. The zinc anomalies determined were ascribed by company geologists to hydromorphic concentrations and not to underlying zinc-enriched bedrock. Further work consisting of detailed geological mapping, soil and stream geochemistry was recommended by a company geologist.

REP — Zinc, Lead
Welcome North Mines Limited — 106 C 8
(Arctic Red Joint Venture) — (64°28'N, 132°05'W)

Reference: Blusson (1974a).

Claims: REP 1-48

Location and Access:

The property is located 3 km south of Duo Lake in the Bonnet plume Range of the Wernecke Mountains. Access is provided by float equipped fixed-wing aircraft from Mayo, 216 km to the southwest.

History:

The claims were recorded in August 1976.

Description:

The property is underlain by shale and calcareous argillite of the Road River Formation which immediately overlie carbonate breccia of the Franklin Mountain Formation. Zinc-lead mineralization is reported to occur in the Road River shale with both a stratiform and fracture controlled habit.

Current Work and Results:

During summer 1976, the property was subjected to reconnaissance (1 inch = 1/2 mile) and detailed (1 inch = 50 feet - REP 19, 5, 40) geological mapping, and geochemical soil and rock sampling. Several geochemical targets were outlined for future work, in addition to 3 areas of outcrop with mineralization.

GYR, ADD, ETC
Harman Syndicate

Zinc, Lead
106 C 10
(64°40'N, 132°40'W)

Reference: Blusson (1974b); Sinclair et al (1976).

Claims: GYR 1-26; ADD 1-32; ETC 1-12

Location and Access:

The claims are located about 217 km northeast of Mayo. Access is by helicopter from Goz Lake, about 24 km southeast of the property.

History:

The GYR claims were staked in July 1974, and the ADD and ETC claims in August 1974. In 1974 and 1975, the property was subjected to geological mapping, prospecting and sampling.

Description:

The property is underlain mainly by Siluro-Devonian limestone with windows of Ordovician Road River Formation shale. The rocks are relatively flat lying and are in contact with a partially overthrust block of the Sheepbed Formation along a northwest trending thrust fault dipping gently to the east.

Mineralization consisting of yellow sphalerite and minor galena occurs within a fossiliferous and conglomeratic facies of the Siluro-Devonian limestone. The sphalerite is present along with white sparry calcite as a conglomerate matrix filling, as thin veinlets and as sphalerite pseudomorphs after fossil fragments. The abundant fossil fragments, rounded limestone clasts and locally discordant attitude of the fossiliferous and conglomeratic facies suggests a possible paleoenvironment for the accummulation of reef breccia. The main mineralized zone is approximately 300 m by 60 m in size.

Current Work and Results:

In summer 1976, a trenching and rock sampling program was conducted on the property. Typical assay values from the rock chip sampling program are presented below:

Sampling interval (ft)	Lead (wt %)	Zinc (wt %)
5	0.44	3.47
10	0.01	3.26

Two trenches were excavated and a grab sample from the bottom of one trench assayed 3.65 % lead, 10.3 % zinc and 0.04 oz/ton silver. Further work consisting of trenching with the use of explosives and a geochemical soil sampling program for lead and zinc was recommended.

PING
Bow River Resources Limited
Highhawk Mines Limited
Cominco Limited

Lead, Zinc
106 C 11
(64°37'N, 133°15'W)

References: Blusson (1974b); Sinclair et al (1976).

Claims: PING 1-26, HW 1-40, CAN 1-24

Location and Access:

The property is located 173 km northeast of Mayo and is accessible by float plane to Pinguicula Lake and from there by helicopter, 8 km to the southeast.

History:

Most of the claims (PING 1-24) were staked in January 1974. In addition, PING 25 and 26 were staked in September 1974. Claims CAN 1-24 were recorded in March 1974 and HW 1-40 in April 1974. Property work in 1975 included geological mapping, IP survey and diamond drilling (Sinclair et al, 1976).

Description:

The property is underlain by rocks of Hadrynian to Ordovician-Silurian in age. Mineralization consists of galena and sphalerite associated with zebra dolomite breccia in dolomite of the Keele Formation. A much more descriptive account with accompanying map is available in the 1975 MIR, (Sinclair et al, 1976, pp. 51-54).

Current Work and Results:

During summer 1976, the PING claims were subjected to detailed geological mapping (1:12,000), IP and VLF geophysical surveys, hand trenching and diamond drilling programs. Four holes were drilled on the PING claims with 1,500 feet of BQ core recovered. However, no significant increase in size potential over 1975 estimates was found.

BROMADROSIS
Wernecke Joint Venture

Uranium
106 C 13
(64°59'N, 133°57'W)

Reference: Blusson (1974a).

Claims: BROMADROSIS 1-6

Location and Access:

The property is located 187 km northeast of Mayo about 3 km east of the Bonnet Plume River. Access was provided by helicopter from Fairchild Lake, 9 km east of the property.

History:

The claims were staked in September 1975 by Wernecke Joint Venture to cover an occurrence of uraniferous float.

Description:

The property is underlain by grey weathering, pink to white calc-silicate rocks of Lower Proterozoic age. They are interpreted as altered country rock peripheral to a major intrusive polymictic breccia body about two miles to the west, centred over Slab Mountain.

Mineralization consists of small amounts of widely disseminated brannerite within a pink siliceous phase of the calc-silicate which locally has a clastic appearance. Haloes of red hematite alteration surround the brannerite.

Current Work and Results:

During summer 1976, the property was subjected to a program of detailed ground radiometric prospecting and the excavation of two trenches.

CORD
Rio Tinto

Zinc, Lead
106 C 13, D 16
(64°52'N, 134°00'W)

References: Blusson (1974b); Green (1972).

Claims: CORD 1-72

Location and Access:

The property is located 164 km northeast of Mayo and 8 km north of Gillespie Lake. Access in 1976 was by helicopter from Fairchild Lake, 18 km northeast of the property.

History:

The claims were staked in June 1975 on the basis of high lead-zinc geochemical results from reconnaissance stream sediment samples in 1974.

Description:

The area is underlain by clastic and carbonate rocks of Helikian age (Units 1, 2 of Green, 1972). Black shale, dark grey siltstone and interbedded dark green andesite of Unit 1 are in contact with a thick sequence of orange weathering, stromatolitic dolomite (Unit 2) that is interbedded with thin dark brown argillaceous siltstone and black shale. Both units are intensely deformed by both folding and faulting. No significant lead or zinc mineralization was discovered, though several pyrite-rich shale and argillite beds were found on the property. Rare narrow sphalerite and galena bearing quartz veinlets occur in the vicinity of these beds. Immediately west of the property, minor chalcopyrite occurs in felsic Tertiary dykes.

Current Work and Results:

During summer 1976, the property was subjected to a detailed stream sediment sampling and reconnaissance soil sampling program for Ag, Co, Cu, Pb, Zn and Ni. In addition, reconnaissance geological mapping and limited rock chip sampling was carried out. Numerous Pb-Zn anomalies were determined by the stream sediment and soil sampling program and rock chip samples from 15 cm thick and 3 m thick pyritic shale beds assayed 7.5 per cent and 0.94 per cent zinc respectively. Further work was recommended to consist of more detailed soil sampling and geological mapping.

PTERD
Archer, Cathro and Associates Limited

Uranium
106 C 14
(64°57'N, 133°18'W)

Reference: Blusson (1974a); Sinclair *et al* (1976).

Claims: PTERD 1-10, 11 Fr., 12 Fr., 13, 14; PNERD 1-4; PTOES 1-22; SKIN 1-4; KNIT ;-26, 9-22

Location and Access:

The property is located about 21 km east of Fairchild Lake and 193 km northeast of Mayo. Access in 1976 was provided by float equipped fixed-wing aircraft to Fairchild Lake and then by helicopter to the property. In addition, some use was made of an airstrip located 3 km south of the property, near the junction of Tetrahedrite and Cobalt creeks.

History:

The PTERD 1-10 claims were staked in July 1975, PNERD 1-4 in August and KNIT 1-8, PTOES 1-8 and SKIN 1-4 in September 1975. The additional claims were all staked in July 1976: KNIT 9-22, PTOES 9-22, PTERD 11 Fr, 12 Fr, 13, 14. Initial staking of the property resulted from the discovery by Wernecke Joint Venture of a train of radioactive float lying on a stagnating alpine glacier. During summer 1975, geological mapping and a radiometric survey were conducted and in spring 1976, the property was optioned to Eldorado Nuclear Limited.

Description:

The property is underlain by fine-grained metavolcanic rocks of Helikian age with siltstone interbeds that are folded and deformed by intrusive explosive gas vent breccias. Subangular to subrounded fragments of pink and flesh coloured chert, carbonate, dark green volcanics and brown siltstone in a carbonate matrix form the polymict breccia. The surrounding country rocks are commonly bleached in colour from dark green to pale green, leached of iron and altered to dolomite. A major north-south fault with associated tectonic breccia cuts across the property and separates stratigraphically lower metavolcanics on the east from higher argillite and carbonate on the west.

Current Work and Results:

During summer 1976, five diamond drill holes (BQ core) for a total of 1,544 feet were drilled on the PTERD 7 and KNIT 9 claims. No significant mineralization was encountered.

BOND
Archer-Cathro and Associates Limited

Uranium
106 D 10
(64°40'N, 134°57'W)

Reference: Green (1972); Sinclair *et al* (1976).

Claims: BOND 1-96

Location and Access:

The claims are located about 128 km northeast of Mayo in the vicinity of the headwaters of Bond Creek. Access was provided by float equipped fixed-wing aircraft to Hart Lake, 120 km north of Mayo and then by helicopter to the

property 6 km to the northeast.

History:

The claims were staked in June and September, 1975. During 1975, detailed geological mapping, geochemical soil sampling and a radiometric survey were conducted. The property was optioned to Eldorado Nuclear Limited in 1976.

Description:

The property is underlain by a window of Proterozoic rocks which are surrounded by Ordovician and Silurian limestone and dolomite. Siltstone with minor interbedded metavolcanics form the Lower Proterozoic rocks. The sequence has been complexly folded and the rocks are foliated in an east-west direction.

Two areas of uranium mineralization have been located. The first (BOND I) consists of a vein occurence of siderite-quartz (±) barite with accompanying minor chalcopyrite, pyrite and pyrrhotite and the second (BOND II) consists of several radioactive, iron and manganese stained, lensoid zones in foliated and brecciated metavolcanics.

Current Work and Results:

During summer 1976, three diamond drill holes (1 AX core) for a total of 391.5 feet were drilled. One drill hole tested the BOND I showing with negative results. Two drill holes tested the BOND II showing and both intersected uranium mineralization.

GNUCKLE
Eldorado Nuclear Limited

Uranium
106 D 16
(64°56'N, 134°18'W)

References: Green (1972);

Claims: GNUCKLE 1-8

Location and Access:

The property is located at the headwaters of Slats Creek, approximately 175 km northeast of Mayo. Access to the property was provided by helicopter from Fairchild Lake, 29 km to the east.

History:

The claims were staked in late July, 1976 over a uranium occurrence found through follow-up of radioactive float located by Wernecke Joint Venture in 1975. The 1976 program was carried out by Eldorado Nuclear Limited under an option agreement with Wernecke Joint Venture; the program was managed by Archer, Cathro and Associates Limited.

Description:

The property is underlain by argillite and quartzite of Helikian age (Unit 1, Green, 1972) that have been intruded by a breccia body. A major fault that cuts through the centre of the claim group is marked by bleaching, silicification and numerous quartz veins.

No mineralization was located in outcrop. However, brannerite occurs in

local accumulations widely spaced throughout the breccia.

Current Work and Results:

During summer 1976, the property was subjected to grid soil geochemical and radiometric survey programs. Soil samples and radiometric measurements were taken at 30 m intervals along lines spaced 50 m apart for a total line length of 5 km.

FACE	Uranium
Eldorado Nuclear Limited	106 D 16
	(64°52'N, 134°20'W)

Reference: Green (1972).

Claims: FACE 1-8

Location and Access:

The property is located on the north side of the Bear River, 176 km northeast of Mayo. Access was provided by helicopter from Fairchild Lake, 31 km to the northeast.

History:

The claims were staked in July 1976 to cover an occurrence of uranium float discovered by Eldorado Nuclear Limited during regional exploration with Wernecke Joint Venture (managed by Archer, Cathro and Associates).

Description:

The property is underlain by argillite and quartzitic argillite of Helikian age (Unit 1, Green, 1972) that have been intruded by a breccia body. Both the breccia and some of the surrounding argillite have been highly carbonatized.

Mineralization consists of brannerite along fractures within a siliceous border phase of the breccia.

Current Work and Results:

During summer 1976, the property was subjected to detailed prospecting, radiometric survey and geochemical soil sampling programs (Cu, Mo, U). Soil samples were collected and radiometric measurements were taken at 30 m intervals along lines spaced 30 m apart for a total line length of 2,000 metres.

OTIS	Uranium
Eldorado Nuclear Limited	106 E 1
	(65°02'N, 134°24'W)

References: Norris (1975); Sinclair *et al* (1976).

Claims: OTIS 1-64

Location and Access:

The claims are located about 193 km northeast of Mayo and are accessible by helicopter from Kiwi Lake, 23 km to the northwest.

History:

The claims were staked in June 1975 by Wernecke Joint Venture managed by Archer, Cathro and Associates Limited. During summer 1975, geological mapping (1 inch = 1/2 mile), soil geochemistry and radiometric survey programs were conducted and the property was optioned to Eldorado Nuclear Limited in 1976.

Description:

The area is underlain by rocks of Helikian age (Unit HO, Norris, 1975), and the property is mostly underlain by green metasedimentary rocks with metavolcanic interbeds. This unit is in fault contact with a younger grey to black pyritic phyllite and argillite and both units have been intruded by a polymictic breccia containing fragments of chert, volcanic rocks, argillite and carbonate rocks set in a carbonate-rich matrix. Locally, some of the country rock has been altered to a grey-green to reddish calc-silicate. Two major faults (north trending and northwest trending) crosscut the property and along them, zones of brecciated country rocks occur that are cemented by quartz and chert with minor hematite and chlorite.

Mineralization consists of locally disseminated brannerite within the fault breccia zone and in small fractures associated with the fault. One to four inch brick red haloes of hematite alteration commonly surround the brannerite.

Current Work and Results:

During summer 1976, prospecting, minor trenching and detailed radiometric survey programs were conducted.

SLATS | 106 E 1
Norcen Energy Resources | (65°02'N, 134°27'W)

Reference: Norris (1975).

Claims: SLATS 1-18

Location and Access:

The claims are located on Slats Creek, 11 km from the mouth of Slats Creek, where it enters the Bonnet Plume River, 180 km northeast of Mayo. Access is provided by helicopter from Margaret Lake, 35 km north, or from Mayo.

History:

The claims were staked in June 1975 for Great Plains Development Company (now Norcen Energy Resources).

Description:

The property is underlain by breccia, argillite and metavolcanics of Helikian age (Unit HO, Norris, 1975). Mineralization consists of specularite and hematite in pods near the contact of the breccia with argillite and also of malachite and chalcopyrite-bornite in float boulders.

Current Work and Results:

During summer 1975, the property was subjected to preliminary geological mapping and geochemical silt sampling for zinc, lead and cadmium.

MAR
Mark V Petroleums and Mines Limited

106 E 1, 2
(65°05'N, 134°30'W)

Reference: Norris (1975).

Claims: MAR 1-48

Location and Access:

The property is located immediately west of Quartet Lakes in the Bonnet Plume River area. Access is provided by float plane to Quartet Lakes, 185 km northeast of Mayo and the property can be easily reached by a short walk from any of the four lakes.

History:

The claims were recorded in January 1976.

Description:

The property is underlain by clastic sedimentary rocks of Helikian age, mainly interbedded quartzite and argillite which dip moderately to the northwest.

Current Work and Results:

During summer 1976, a geochemical soil sampling survey was conducted. A total of 293 soil samples was collected at 200 foot intervals along lines spaced 400 feet apart. Several anomalous areas were determined and further prospecting was recommended.

THOR
Great Bear Mining Limited

Uranium, Copper
106 E 1
(65°03'N, 134°25'W)

Reference: Norris (1975).

Claims: THOR 1-32

Location and Access:

The property is located 8.1 km south of Quartet Lakes in the Bonnet Plume River area. Access is provided by float plane to Quartet Lakes, 185 km northeast of Mayo, and then by foot or helicopter to the property.

History:

The claims were recorded in February 1976. They were staked by A. Harman to cover rock units favourable to copper and uranium mineralization and were subsequently acquired by Great Bear Mining Limited.

Description:

The property is underlain by rocks of Unit HO (Norris, 1975), i.e. dark grey, grey green and black thin-bedded argillite, slate and phyllite, minor grey quartzite, orange weathering dolomite and conglomerate. The rocks are isoclinally folded about a northeast striking axial plane dipping 52° to the northwest. In addition, an intrusive breccia body trends in a southwesterly direction across the south end of the property. The breccia body is approx-

imately 31 m thick and has been traced for a minimum length of 465 m. Breccia fragments are angular to rounded and consist of thinly laminated carbonate, jasperoidal chert, mudstone and argillite. The matrix is sparry calcite with some specular hematite and particle size ranges from microscopic to one foot in diameter.

Mineralization consists of pods of brannerite and specular hematite within chloritized and feldspathized fractured argillite in contact with the breccia body (THOR 11, 13, 14). The degree of fracturing and the grade of mineralization increases near the contact. Two rock chip samples assayed 0.80 and 1.14 lb U_3O_8/ton. A grab sample from a piece of mineralized breccia float assayed 0.96 lb U_3O_8/ton. In addition, chalcopyrite locally occurs in quartz veins within argillite (THOR 2) and malachite occurs along bedding planes within argillite (THOR 27, 29).

Current Work and Results:

During summer 1976, the property was subjected to preliminary prospecting, geological mapping and geochemical stream sediment sampling. Seven stream sediment samples were collected and analyzed for uranium. Further work consisting of geochemical soil sampling, ground radiometric survey and detailed geological mapping and prospecting was recommended.

TET — Copper, Uranium
Thor Explorations Limited — 106 E 1
(65°05'N, 134°30')

Reference: Norris (1975).

Claims: TET 1-54

Location and Access:

The property is located 5 km southwest of Quartet Lakes and 8 km west of the Bonnet Plume River. Access is provided by float equipped aircraft to Quartet Lakes, 185 km north of Mayo and thence by foot, 5 km south to the property.

History:

The claims were recorded in February 1976. They were staked by A. Harman to cover rock units potentially favourable to copper and uranium mineralization. The ground was subsequently acquired by Thor Explorations Limited.

Description:

The property is underlain by rocks of the Lower Proterozoic unit HO of Norris, 1975, mainly dark grey, grey green and black, thin-bedded argillite, slate and phyllite and minor grey quartzite, orange weathering dolomite and conglomerate.

Three main mineralized showings occur on the property. The north showing (TET 21, 22) consists of chalcopyrite and minor bornite in fractures and as discrete grains in a thick bedded, rusty weathering, fine-grained quartzite unit. The unit has a minimum thickness of 12 metres, of which the lowermost 3 to 5 metres is reported to be mineralized over an exposed strike length of 12 metres. Locally, up to 95 per cent of the rock is hematite and magnetite. A rock chip sample over a 3.3 m area assayed 1.92 per cent copper. In addition, copper mineralized quartzite float occurs elsewhere on the property.

The west showing (TET 54) occurs on the south side of a steep-sided westerly trending ridge. There, similar stratigraphically controlled mineralization occurs within an 8 metre thick sequence of quartzite, shale and carbonates. The uppermost bed in the mineralized sequence is a 0.9 metre thick, fine-grained white quartzite in which chalcopyrite, malachite and azurite occur in fractures, vugs and disseminated throughout the rock. A continuous rock chip sample across the 0.9 metre thick bed assayed 10.4 per cent copper. Below the quartzite bed, a 1.8 metre thick, thin-bedded, light green shale unit occurs with thick coatings of malachite and azurite on bedding surfaces and in fractures. A continuous rock chip sample across the 1.8 metre thick bed assayed 4.50 per cent copper. Below the shale unit, a sparsely mineralized carbonate bed occurs that is about 3 to 5 metres thick. The three units are reported to be mineralized for approximately 120 metres of strike length.

The southeast showing (TET 2) occurs on the north side of a northeasterly flowing stream in the southeastern side of the property. Chalcopyrite and malachite occur with quartz veins in argillite and fractured quartzite bands over a strike length of 6 metres. In addition, stringers of brannerite occur in a 0.9 metre wide breccia zone made up of argillite breccia fragments in a quartz-carbonate matrix. A grab sample from a small area of radioactive argillite assayed 0.077 per cent U_3O_8.

Current Work and Results:

During summer 1976, a detailed geochemical soil sampling program was conducted over the northern portion of the claims. A total of 284 soil samples were collected at 200 foot intervals along lines spaced 400 feet apart and anaylyzed for Cu-U. Three large coincident Cu-U anomalies were determined, two of which were explained as being due to the chalcopyrite-hematite bearing quartzite unit. Further work was recommended to consist of detailed geologic mapping, further geochemical soil sampling, magnetic and radiometric surveys.

WERNECKE	Uranium
Wernecke Joint Venture	106 E 1
	(65°08'N, 134°23'W)

Reference: Norris (1975); Sinclair *et al* (1976).

Claims: WERNECKE 1-82

Location and Access:

The property is located on Quartet Mountain about 193 km northeast of Mayo and access is provided by helicopter from Kiwi Lake, 13 km to the northwest.

History:

The claims were staked in June (1-42) and September (43-82) 1975 by Wernecke Joint Venture (Standard Oil Company of B.C. Limited, Aquitaine Company of Canada Limited). During summer 1975, the property was subjected to programs of geological mapping, soil geochemistry, and airborne and ground radiometric surveys. In 1976, the property was optioned to Eldorado Nuclear Limited.

Description:

The property is underlain by Lower Proterozoic argillite, quartzite and metavolcanics (Unit HO, Norris, 1975).

Intrusive to the sequence is a polymictic breccia body which occurs locally as a pipe or as pods and discontinuous lenses. Clast material consists of pale grey to cream chert, dark volcanics and argillite with minor jasper and carbonate. The matrix is fine grained, grey, calcareous and occasionally pitted with rhomb shaped vugs, probably after siderite. Toward the margins of the body, the matrix commonly is dark brown and cherty. Within the country rock and margin of the breccia bodies, a dolomite alteration consisting of abundant magnetite and some biotite is common. The altered rock is pale grey to cream and weathers to a deep red-brown colour. The entire sequence is intruded by lamprophyre and other dykes of mafic affinities.

Mineralization is exposed in felsenmeer only and consists of widely disseminated fine- to coarse-grained brannerite (and possibly some uraninite).

Current Work and Results:

During summer 1976, the property was subjected to detailed geological mapping (1:3,000), and ground radiometric prospecting.

MTR — 106 E 1
New Minex Resources — (65°09'N, 134°21'W)

Reference: Norris (1975).

Claims: MTR 9-16, 25-32, 39-48

Location and Access:

The property is located 6.5 km northeast of and immediately west of the Bonnet Plume River. Access is provided to Quartet Lakes by float plane from Mayo, 185 km to the southwest and then by helicopter to the property.

History:

The claims were recorded in February 1976. They were staked by A. Harman and Associates on the basis of proximity to the WERNECKE claim group where uranium mineralization is known to occur. Subsequently in August 1976, the property was acquired by New Minex Resources Limited.

Description:

The property is underlain by Helikian clastic sedimentary rocks of Unit HO (Norris, 1975).

Current Work and Results:

During summer 1976, a geochemical soil sampling program was conducted. A total of 167 soil samples were collected at 200 foot intervals along lines spaced 1,500 feet apart and analyzed for copper-uranium. Two areas of weakly anomalous uranium values and one coincident copper-uranium anomaly were determined. Further work consisting of follow-up prospecting, fill-in geochemical soil sampling and a ground radiometric survey was recommended.

GREMLIN
Cyprus Anvil Mining Corporation

Copper
106 E 2
(65°11'N, 134°38'W)

Reference: Norris (1975).

Claims: GREMLIN 1-12

Location and Access:

The property is located 16 km west of the Bonnet Plume River and 16 km south of Margaret Lake, about 193 km north of Mayo. Access is provided by float plane to Kiwi Lake, about 1.5 km to the north.

History:

The claims were staked during August 1975, as a follow-up on a Cu geochemical anomaly determined by a regional stream sediment geochemical program. In 1975, the property was subjected to preliminary geochemical soil sampling.

Description:

The area is underlain by a series of argillite and volcanic rocks of Helikian age, Unit HO of Norris (1975) that have been intruded by a concordant breccia body. Further mapping by company geologists has subdivided Unit HO into three subunits in the vicinity of the GREMLIN claims:

- Lower Volcanic Unit - consists of several hundred metres of slaty, grey-green tuff overlain by approximately 120 m of breccia. The breccia consists of abundant angular blocky clasts of volcanics and jasper with hematite and carbonate forming the matrix and has locally contact metamorphosed the tuff into a chloritoid schist with prominent chloritoid porphyroblasts.

- Argillite Unit - overlies the Lower Volcanic Unit and consists predominantly of dark brown to black shale, about 450 m to 680 m thick. Within the Unit, two 15 m horizons of dark grey, chocolate brown weathering, coarsely crystalline dolomite occur, each capped by a few feet of light grey, pyritic chert.

- Upper Volcanic Unit - overlies the Argillite Unit and consists of several hundred feet of medium green chlorite-sericite schist, the base being a 30 m thick bed of pale pink chert.

Mineralization is exposed along the walls of a narrow canyon and consists of the following associations:

1) pyrite and chalcopyrite as disseminated grains within the thin chert horizons, possibly parallel to bedding;

2) as siderite-quartz-pyrite-chalcopyrite (rare cobaltite) veins in the dolomite and uncommonly in the underlying shale;

3) as azurite and malachite within black shale both above and below the chert horizons;

4) pyrite and chalcopyrite as irregular coarse clumps in the breccia matrix and disseminated within the clasts.

Current Work and Results:

The area around the property was geologically mapped (1 inch = 1/2 mile) and soil sampled (Cu, Pb, Zn) along elevation contours during summer 1976. The property itself was subjected to detailed geological mapping (1 inch = 400 feet) and geochemical soil and silt sampling for Cu, Pb, Zn. Soil samples were collected at 135 foot intervals along the 2,900 foot and 2,500 foot elevation contours, but no significant new anomalies were determined. Recommended further work includes geological mapping at a more detailed scale, ground magnetic survey and hand trenching.

MST
Ogilvie Joint Venture
Archer, Cathro and Associates Limited

Lead, Zinc
106 E 3
(65°09'N, 135°04'W)

Reference: Norris (1975).

Claims: MST 1-40

Location and Access:

The property is located between the Wind River and Illtyd Creek, about 176 km north of Mayo. Access is by float plane from Mayo to Kiwi Lake and then by helicopter, 23 km to the southwest.

History:

The claims were staked in June 1974 to cover a lead-zinc occurrence found by the Ogilvie Joint Venture. Reconnaissance geological mapping and soil sampling were conducted in 1974 and detailed geological mapping, grid soil sampling and a radiometric survey were conducted over part of the property in 1975.

Description:

The property is underlain by a sequence of Lower Cambrian sedimentary rocks which consists of a thick section of shale, grit, conglomerate, clastic limestone and dolomite unconformably overlying Proterozoic quartzite.

Lead-zinc mineralization is present as galena and sphalerite cementing thin discontinuous horizons of coarse sandstone near the eastern limit of the Lower Cambrian conglomerate. In addition, minor occurrences of radioactivity have been located in a brecciated dolomite overlying the clastic sequence.

Current Work and Results:

During summer 1975, a ground radiometric survey was conducted over a 2,600 by 1,400 metre grid at 50 metre intervals along lines 100 metres apart. A weakly anomalous area was determined. No specific radioactive mineral has been indentified.

LAURA
Norcen Energy Resources

Zinc
106 F 2
(65°05'N, 132°50'W)

Reference: Norris (1975).

Claims: LAURA 1-22

Location and Access:

The property is located on a large tributary of the Snake River, 83 km east-southeast of Margaret Lake and 225 km northeast of Mayo. Access is provided by helicopter from Margaret Lake or several other lakes in proximity.

History:

The claims were staked during July, 1975.

Description:

The property is underlain by Rapitan mudstone and limestone which are thrust over Lower Cambrian sedimentary rocks. Locally, the geology consists of zebra-breccia dolomite, calcareous shale and calcareous chert-quartz-pebble conglomerate which generally have a northeasterly strike and gentle dip to the east. Float mineralization consisting of pyrite and sphalerite has been detected along the river bank and in addition, an area of hydrozincite weathering was noted in some of the dolomite.

Current Work and Results:

During summer 1975, the property was subjected to detailed geological mapping (1 inch = 400 feet) and a soil geochemical survey for lead, zinc and cadmium. Soil samples were taken on grid lines 200 feet apart at 200 foot intervals for a total line length of 13,000 feet. Three short X-ray diamond drill holes were drilled for a total of 260 feet. Results were inconclusive.

BUH
Norcen Energy Resources

Lead, Zinc
106 F 2
(65°06'N, 132°57'W)

Reference: Norris (1975).

Claims: BUH 1-10

Location and Access:

The property is located 80 km east-southeast of Margaret Lake near the Snake River and 225 km northeast of Mayo. Access is provided by helicopter from Margaret Lake.

History:

The claims were staked in July, 1975.

Description:

The property is underlain by Hadrynian dolomite and clastics which have an east-west trend and dip gently to the south. Mineralization consists of sphalerite and galena as vug and fracture fillings in dolomite. The highest

assay was determined from a 1.5 m chip sample across one mineralized horizon: 8.6 per cent zinc, 2.8 per cent lead and 300 ppm cadmium.

Current Work and Results:

During summer 1975, the property was subjected to programs of geochemical soil sampling for lead, zinc and cadmium and detailed geological mapping. Soil samples were collected at 200 foot intervals along lines spaced 200 feet apart for a total line length of 14,400 feet. Further work consisting of several short diamond drill holes were recommended by a company geologist.

PAT, CAL — 116 A 7
Sumitomo Metal Mining Canada Limited — (64°30'N, 136°35'W)

Reference: Green (1972).

Claims: CAL 1-10; PAT 1-6

Location and Access:

The property is located 108 km north-northwest of Mayo in the Ogilvie Mountains. Access is provided by helicopter from Mayo or the Dempster Highway, 74 km to the west.

History:

The claims were staked in July, 1975 on the basis of anomalous stream sediment zinc values.

Description:

The CAL claims are underlain by Precambrian and/or Cambrian shale, chert and limestone (Unit 3, Green, 1972) situated between two major westerly trending and southerly dipping diorite sills. The PAT claims are underlain by chert and cherty shale of Unit 3 which are overlain by a thrust sheet of Ordovician and Silurian limestone and minor siliceous limestone. No mineralization has been found on the property.

Current Work and Results:

During July, 1976, the properties were subjected to soil geochemical surveys for lead, zinc and cadmium performed by UMEX. One hundred seventy-five samples were collected at 200 foot intervals along lines spaced 400 feet apart. Only minor anomalies were determined and no further work was recommended.

LAST — 116 A 15
Union Miniere Explorations and Mining Corporation — (64°51'N, 136°38'W)

Reference: Green (1972).

Claims: LAST 1-8

Location and Access:

The property is located in the Wernecke Mountains, 20 km east of the junction of Hart River and Rae Creek. Access is by helicopter from Mayo or Dawson, both about 153 km to the south.

History:

The claims were recorded in August 1975 and staked as part of the UMEX-Shell 'Blackstone Project' joint venture.

Description:

The claims are underlain by clastic rocks of the Lower Proterozoic (Unit 1, Green, 1972). Unit 1 consists of mainly dark grey, grey-green and black, thin-bedded argillite, slate and phyllite with minor grey quartzite, orange-weathering dolomite and conglomerate.

Current Work and Results:

During summer 1976, the property was subjected to geological mapping (1 inch = 1,000 feet) and geochemical soil sampling which outlined two Cu-Co-Ag anomalies.

DAWSON MINING DISTRICT

WON | Copper, Molybdenum
Kerr Addison Mines Limited | 115 I 13
(62°52'N, 137°56'W)

References: Tempelman-Kluit (1974a); Sinclair et al (1976, p. 80).

Claims: WON 1-24, 79-90, 101-118

Location and Access:

The claims straddle an east-flowing tributary of Black Creek, roughly 33 km west-northwest of Fort Selkirk in the Dawson Range. Access in 1976 was by helicopter.

History:

The original WON claims were staked in October 1973 and June 1974. The current WON 1-24 claims were staked in August 1975 to cover ground which had been staked earlier but which had lapsed. Surface exploration including some test pitting was carried out in 1974.

Description:

Regional mapping has indicated that the property is generally underlain to the east by Triassic volcanics which include altered andesite and basalt and related pyroclastics. To the west, the volcanics are intruded by Triassic granodiorite, locally foliated due to alignment of mafic minerals.

Current Work and Results:

An additional I.P. survey on the WON claims outlined three anomalous zones. In addition, a resistivity sounding technique was successfully used in determining overburden depths.

SAM, MAC, FOX, RAY, OX, RT | 115 O 11
Andac Resources Limited | (63°31'N to 63°42'N, 139°11'W to 139°12'W)

Reference: Bostock (1942).

Claims: SAM 1-24; MAC 67-70, 126-138; FOX 1-14; RAY 1, 2, 4, 6, 8, 10, 12, 14; OX 1-32; RT 1-32

Location and Access:

The claims are situated about 56.3 km south of Dawson straddling the Indian River.

History:

The claims were staked in April 1975.

Description:

Tertiary and recent stream deposits underlie the northern half of McKinnon Creek area. Tertiary conglomerates and andesites are mapped in the remainder of the area except for some ultrabasic rocks which outcrop in the eastern portion of the McKinnon Creek area and gneissic rocks which are exposed in the northeast corner of Montana Creek area.

Current Work and Results:

A helicopter-borne magnetic survey was conducted. Lines were flown at a spacing of 200 m with a mean terrain clearance of 45.7 m. A total of 545 line-kilometres were flown.

LUCKY JOE	Copper, Molybdenum
Rio Tinto Canadian Exploration Limited	115 0 11, 12
	(63°35'N, 139°30'W)

References: Bostock (1942); Sinclair *et al* (1975, pp. 80-81).

Claims: B 1-16; SUNEP 1-14, 18-34; BJB 1-17; ASH 1-44; PAX 1-10

Location and Access:

The property lies near the headwaters of Lucky Joe Creek, 6 miles (10 km) east of the Yukon River and roughly 30 miles (50 km) south of Dawson. Access in 1976 was by helicopter from Dawson. In addition, a 22-mile (35 km) long winter road extends from the mouth of Quartz Creek south to the centre of the property.

History:

The B claims were staked in the summer of 1970 by Silver Standard Mines Limited who carried out soil sampling, geological mapping and trenching during the same year. In 1971 Silver Standard drilled three diamond drill holes totalling 140 m. In 1975 the property was optioned by Rio Tinto Canadian Exploration Limited who staked additional claims, the SUNEP, BJB, ASH and PAX groups, peripheral to the B claims. Rio Tinto carried out geological mapping, soil sampling and geophysical surveys and drilled two holes totalling 425 m.

Description:

The property is underlain by Klondike Schist of the Yukon Metamorphic Complex, mapped as Unit E by Bostock (1942). Rocks exposed on the property consist of biotite schist, quartz-muscovite schist and biotite quartz gneiss. The metasediments are enclosed to the east and west by bodies of gneissic granite (Unit A, op. cit.) which is exposed on the west and northwest portions of the claims groups. Chalcopyrite and pyrite with minor amounts of molybdenite occur in fractures in biotite and quartz-muscovite schists.

Current Work and Results:

In 1976 Rio Tinto drilled five holes totalling 1,219 m on claims B 1 and B 2.

MIKE, CAN	Gold, Silver
Canalta Resources Limited	116 A 5
	(64°15'N, 137°55'W)

References: Cockfield (1920); Green (1972).

Claims: MIKE 1-24; CAN 1-30, 45

Location and Access:

The property is located approximately 74 km north-northeast of Dawson and 27.4 km east of the Dempster Highway. Access is by helicopter from Dawson or the Dempster Highway.

History:

The claims were staked in June 1975 and this assessment work done in 1975.

Description:

The claims are underlain by quartzite, chert and argillites (Unit 3, Green, 1972) which are intruded by syenite (Unit 21b, Green, 1972). Mineralization consists of auriferous quartz-arsenopyrite veins occuring near sediment-syenite contacts.

Current Work and Results:

Mineralization occurs in two zones trending easterly with steep dips. The south zone is an average of 1.2 m wide and has been traced for a distance of 300 m. Surface trenching of this zone gave gold values from 0.01 to 1.548 oz/ton. Diamond drilling (3 holes for a total of 189 m) shows the vein mineralization to be continuous at depth. The north zone was sampled and trenched for a distance of 483.5 m. The main vein is steeply dipping to the south with a maximum width of 6.1 m. All sulphides found were oxidized and further work was recommended to establish the grade of fresh sulphides.

TING, NOTING, PROSPECTING	Uranium
Archer, Cathro and Associates Limited	116 B 7
(Ukon Joint Venture)	(64°23'N, 138°36'W)

References: Cockfield (1920); Tempelman-Kluit (1970); Green (1972).

Claims: TING 1-50; NOTING 51-76; PROSPECTING 77-84

Location and Access:

The claims are located 49 km northeast of Dawson. Access in 1976 was by helicopter from a camp at Mile 45 (Km 72) of the Dempster Highway.

History:

The claims were staked in the spring and summer of 1976 for the Ukon Joint Venture managed by Archer, Cathro and Associates Limited.

Description:

The TING, NOTING and PPROSPECTING claims are located on the Tombstone Stock. The stock is composed of coarse-grained alkaline plutonic rocks of Lower Cretaceous age, ranging from alkali syenite, tinguaite, nepheline syenite and monzonite to silica-saturated rocks of granodioritic and quartz dioritic composition. The major minerals observed are orthoclase, plagioclase, nepheline, cancrinite, calcite, biotite, hornblende pyroxene and quartz. Accessory minerals identified so far include sphene, zircon, apatite, melanite garnet, fluorite, apatite and opaques. Trachytic dykes are found in the area of the stocks cutting the country rocks. Radioactivity is associated with the tinguaite and dykes at the eastern margin of the stock near Mt. Monolith. The stock is intrusive into orthoquartzite, (Keno Hill Quartzite) and diabase and xenoliths of the country rocks are common in the stock.

Current Work and Results:

Helicopter-borne radiometric surveys near the area outlined numerous anomalies associated with the intrusive rocks. The spectrometer was operated on the total count mode for the surveys but anomalies were checked spectrally on U, Th and K channels. Mineralization seems to be associated with the pseudoleucite tinguaite as primary uranium minerals disseminated in the rock. Secondary yellow uranium mineralization is found on fractures. In addition to a scintillometer survey, soil, silt, water and rock samples near the showing were analyzed for uranium and thorium.

NEBULOUS
Archer, Cathro and Associates Limited
(Ukon Joint Venture)

Uranium
116 B 7
(64°28'N, 138°46'W)

References: Cockfield (1920); Lambert (1966); Tempelman-Kluit (1970); Green (1972).

Claims: NEBULOUS 1-33

Location and Access:

The claims are located 49 km northeast of Dawson in the Cloudy Range between the Chandindu and Blackstone Rivers. Access in 1976 was by helicopter from a camp at Mile 45 (Km 72) of the Dempster Highway.

History:

The claims were staked in the summer of 1976 for the Ukon Joint Venture.

Description:

The claims are located on the Lower Cretaceous Mt. Brenner stock which has a core of porphyritic quartz monzonite and is concentrically zoned successively by prophyritic hornblende monzonite, monzonite porphyry, a thin band of pyroxenite and augite-biotite porphyry (Lambert, 1966). The stock is surrounded mainly by a Lower Cretaceous orthoquartzite (Keno Hill quartzite) and diabase.

Current Work and Results:

A helicopter-borne radiometric survey was conducted over the stock with the instrument in the total count mode. Spectral checks for U, Th and K were made on anomalies. The highest zone of radioactivity was associated with a crescent shaped zone of monzonite porphyry, but most is likely due to a high thorium content. Soils, silts, waters and rock chips and whole rocks were analyzed for uranium. Uranium mineralization is visible mostly as a yellow coating on joints and as fracture fillings in two zones.

C
Chevron Standard Limited

Uranium
116 B 8
(64°17'N, 139°13'W)

References: Cockfield (1920); Tempelman-Kluit (1970); Green (1972).

Claims: C 1-69

Location and Access:

The property is located on Antimony Mountain 61 km east-northeast of Dawson. Access in 1976 was by helicopter from Dawson.

History:

The claims were staked in 1975. In the past, interest has been shown in the stock for gold, copper and antimony mineralization.

Description:

The claim group is underlain by unit 21b (Green, 1972) which is an intrusive stock of Cretaceous age named the "Antimony Stock". The stock consists of hornblende and hornblende/biotite syenite.

Current Work and Results:

A ground radiometric survey using total-count scintillometers, was carried out on grid lines. A uranium soil and stream silt geochemical survey was also conducted. No significant anomalies were indicated though certain phases of the intrusive have a higher background. Further work was recommended.

A.J., UP
Cons Acheron Mines Limited

Gold, Silver
116 B 8
(64°17'N, 138°10'W)

References: Cockfield (1920); Tempelman-Kluit (1970); Green (1972).

Claims: A.J. 1-42; UP 1-12

Location and Access:

The property is located on Antimony Mountain 53 km west-northwest of Dawson. Access is by helicopter from Dawson or from the Dempster Highway.

History:

The claims A.J. 3-6, 15-16, were optioned from Conwest Exploration Company Ltd. and the remaining claims were staked in the first week of August 1975 to cover the surrounding ground. The A.J. claims were originally staked in 1966 following discovery of gold-bearing arsenopyrite veins. During that year surface trenching, prospecting and diamond drilling of four short holes was completed by Conwest Exploration Company Ltd. In 1975, Acheron Mines Limited (name changed to Cons Acheron Mines Limited in April 1976) optioned the property and had this assessment work done.

Description:

The claims are underlain by quartzite (Unit 3, Green, 1972) and syenite and diorite (Unit 21b, Green, 1972). Auriferous arsenopyrite mineralization is associated with shears and fracture zones in the quartzites.

Current Work and Results:

Two zones of mineralization were outlined on the property by trenches and 3 diamond drill holes. Three viens, 0.6 to 2.1 m wide and assaying .003 to 5.328 oz/ton gold and less than 1 oz/ton silver were located in the south zone. Work on the North zone delineated three veins 0.3 to 1.5 m wide assaying 0.112 to 8.712 oz/ton gold and 0.21 to 1.72 oz/ton silver. A soil geochemical survey for arsenic and zinc was inconclusive. Further diamond drilling was recommended in order to outline the vein systems adequately.

A, B, AB
Chevron Standard Limited

Uranium
116 B 11
(64°32'N, 139°07'W)

References: Cockfield (1920); Tempelman-Kluit (1970); Green (1972).

Claims: A 1-16; B 1-4, AB 1-76; WAD 1-16

Location and Access:

The property is located near Deadman's Gulch about 56.3 km north of Dawson. Access in 1976 was by helicopter from Dawson.

History:

The claims were staked in 1975.

Description:

The claim groups are underlain by unit 21b of Green (1972) which is an intrusive stock of Cretaceous age. The intrusive, which is called the 'Deadman Stock', is a multiphase pluton in which the three main phases are; (1) pink and grey equigranular hornblende biotite syenite, (2) pseudolucite-tinguaite, and (3) quartz monzonite. Uranium and thorium mineralization is found associated with the intrusive.

Current Work and Results:

A ground radiometric survey with total count scintillometers over a grid was carried out in conjunction with a soil geochemical survey. The claims were also mapped geologically and further work was recommended.

ID, OD, DAS, LALA
Union Miniere Explorations and Mining Corporation Limited
Shell Canada Resources Limited

Copper, Lead, Zinc
116 B 13, 14
(64°49'N to 64°55'N, 139°15'W to 139°45'W)

Reference: Green (1972).

Claims: ID 11-16; OD 19-34; DAS 1-42; LALA 1-60

Location and Access:

The claims are situated within 15-30 km north of Mount Harper. Access to the claims was by helicopter from a base camp at Mile 68 on the Dempster Highway, distances of about 48-72 km.

History:

All claims were staked in 1975 as part of the Blackstone Project - a UMEX-Shell joint venture.

Description:

The ID, DAS and LALA claims are underlain by a sequence of Proterozoic clastic sediments. The OD claims are underlain by limestone and stromatolitic dolomites. The LALA claims also contain some Cambro-Ordovician carbonates. The clastic rocks consist of maroon shale and siltstone, maroon pebble-conglomerate, pink cherty dolomite, black shales, sandy dolomite and quartzite.

Current Work and Results:

A soil geochemical survey was conducted on the various claim groups and seven Co-Cu soil anomalies were found on the DAS claims and several on the LALA group; Pb-Zn anomalies were detected on the OD group. The ID group was mapped geologically and copper mineralization was found within a major fault zone.

RG
Cons Acheron Mines Limited

Asbestos
116 C 7
(64°25'N, 140°40'W)

References: Green (1972).

Claims: RG 1-8

Location and Access:

The claims are located 4.8 km southeast of the Clinton Creek Mine and lie approximately 1 km north of the main highway from Dawson to Clinton Creek.

History:

In 1971-72 surface exploration and diamond drilling and in 1974 surface exploration was conducted on the property.

Description:

The claims are underlain by metamorphic rocks of the Nasina series (Unit A, Green, 1972) with some occurrences of asbestos-bearing ultramafic rocks.

Current Work and Results:

There was a limited amount (86 m^3) of trenching done.

RIO, NATE, CARB
Rio Alto Exploration Limited

116 K 8, 9
(66°30'N, 140°20'W)

Reference: Norris (1976, p. 461).

Claims: RIO 1-60; NATE 3-14; CARB 3-16; YETI 1-12

Location and Access:

The claims are located about 29 km east of the Alaska border approximately 280 km north of Dawson City and 112 km south of Old Crow. Access is by helicopter from either Dawson or Old Crow.

History:

The claims were staked in September 1975.

Description:

The claims are in unglaciated terrain. The exposed sedimentary section is a maximum of 18,750 m thick and spans the Proterozoic to the lower Cretaceous. The Proterozoic is composed mainly of clastics with a small amount of carbonates. The Lower Paleozoic unconformably overlies the Proterozoic rocks and consists of Cambrian to Devonian dolomite. The Upper Paleozoic consists of Upper Devonian and Mississippian shales, Mississippian and Pennsylvanian carbonates, and Pennsylvanian and Permian shales. Mesozoic clastics of Triassic, Jurassic and Lower Cretaceous age unconformably overlie the Upper Paleozoic. The Laramide orogeny appears to have been the dominant cause of the folding and faulting in the area.

Current Work and Results:

The area was mapped at a reconnaissance scale and a soil geochemical survey was conducted on the claims. A dark bluish-black massive oolitic iron formation, 366 m in outcrop length and 46 m thick, grades 52-55 per cent Fe and is conservatively estimated to contain 30 million tons averaging 55 per cent Fe. There are also several showings of sphalerite, smithsonite, aurichalcite, tetrahedrite, malachite, azurite and pyrite in middle Devonian dolomites. Several shallow trenches were dug along a scree slope to outline an occurrence of smithsonite and aurichalcite float which was consistently found at depths of 15-25 cm below surface.

WHITEHORSE MINING DISTRICT

SM
Exploram Minerals Limited

Lead, Zinc
105 C 13
(60°58'N, 133°46'W)

References: Mulligan (1963); Sinclair et al (1976, p. 96).

Claims: SM 1-8

Location and Access:

The claims are situated between Slate and Red Mountain creeks, 48 miles (79 km) east-northeast of Whitehorse. Access in 1976 was by helicopter from Whitehorse.

History:

The property was originally staked in 1935 and has been restaked several times since. The current SM claims were staked in 1974. In 1975 El Paso Mining and Milling Company carried out geological mapping, soil and rock geochemical surveys and a VLF-EM survey.

Description:

Galena and sphalerite occur as blebs, stringers and disseminations in brecciated graphitic slate and phyllite assigned to the Big Salmon Complex of Mississippian age or earlier (Unit 1, Mulligan, 1963).

Current Work and Results:

Three diamond drill holes totalling 1,000 feet (300 m) were drilled in 1976. The drilling encountered mainly graphitic slate and phyllite containing minor mineralization in brecciated zones. The mineralization consisted of 1) disseminated galena and sphalerite associated with up to 5 per cent pyrite; 2) galena and sphalerite blebs coating rims of quartz-rich breccia fragments; and 3) galena and sphalerite stringers associated with quartz-carbonate veinlets. The mineralization was considered sub-economic by company geologists.

MURPHY
Archer-Cathro (Ukon Joint Venture)

Uranium
105 C 13, F 4
(61°00'N, 133°35'W)

Reference: Mulligan (1963).

Claims: MURPHY 1-24

Location and Access:

The claims are located 85 km northeast of Whitehorse. Access was by helicopter from Whitehorse or from camps on the South Canol Road.

History:

The claims were staked in 1975 for the Ukon Joint Venture, managed by Archer-Cathro and Associates Limited.

Description:

The claims straddle the contact between the Big Salmon Complex of metamorphic rocks and granite and granodiorite of the Coast and Cassiar intrusions. The intrusive rocks are commonly medium- to coarse-grained, with porphyritic plagioclase, orthoclase, smokey quartz and considerable ferromagnesian minerals, mainly biotite and hornblende.

Current Work and Results:

A Scintrex GAM-1 spectrometer with a 1853 cm^3 NaI(Tl) crystal and a strip chart recorder was used in a helicopter flown at 100 km/hr with a terrain clearance of 50-75 m. Total count mode with a time constant of 3 sec. was utilized. The airborne survey outlined the claim group area as one of slightly abnormal radioactivity.

A Scintrex BGS-1SL broadband scintillometer was used for a ground reconnaissance survey. This outlined two adjacent zones of anomalous radioactivity. The uranium appears to be mainly in the form of secondary yellow and green oxides coating leached cavities. In addition, soil, silt and rock samples were analyzed for uranium. The uranium mineralization is associated with the intrusive but no clear geochemical pattern within the intrusive is evident.

BECKER-COCHRAN PROPERTY
Con-Am Resources Limited

Antimony
105 D 3
(60°11'N, 135°13'W)

References: Cairnes (1910, p. 48; 1916, p. 45); Bostock (1941, p. 35); Wheeler (1961, p. 132); Green (1965, p. 42; 1966, pp. 52-55); Findlay (1967, p. 43; 1969a, p. 57); Sinclair et al (1975, pp. 147-148).

Claims: POP 1-14; DIANE 1-8; CARBON 1-4

Location and Access:

The property is situated west of Becker Creek on the northeast side of Carbon Hill at elevations above 5,000 feet. Access is presently by helicopter from Whitehorse, 61 km to the north. A 40 km gravel road via Annie Lake connects the property with the Carcross Road but there are no bridges at present across the Wheaton River, which can only be forded when the water is low.

History:

The property is an old one, originally discovered in 1893 and explored intermittently since then. The POP claims were staked in 1973 and re-examined briefly in 1974.

Description:

Granitic rocks of the Coast Intrusions (Unit 8, Wheeler, 1961) underlie most of the property. Antimony occurs in a five-foot wide shear zone, trending 130° and dipping 75° southwest in a small body of altered acidic volcanic rocks (Unit A, op. cit.) contained with the granitic rocks. Fine-grained stibnite and pyrite, and massive knots of coarse stibnite crystals occur with quartz gangue as irregular patches and lenses within the shear zone.

Current Work and Results:

Work on the property in 1976 consisted of geological mapping and a VLF-EM survey.

FLEMING GODDELL PROPERTIES
Con-Am Resources Limited

Antimony
105 D 3
(60°11'N, 135°17'W)

References: Cairnes (1912, pp. 126-128; 1916, pp. 47-48); Cockfield and Bell (1944, p. 17); Bostock (1941, pp. 35, 37-38); Wheeler (1961, pp. 133-135); Green (1966, pp. 52-55).

Claims: DIANE 1-8; CARBON 1-4

Location and Access:

The properties consist of two adjacent claim groups situated on the northwest face of Carbon Hill, on the south side of the Wheaton River. The principal showings occur at elevations of 4,000 to 5,000 feet. Access is normally by helicopter from Whitehorse or from the gravel road which leads to the Becker-Cochran property.

History:

The claims cover showings which have been explored intermittently since the early 1900's. The DIANE claims cover showings previously staked as the Porter or Fleming group and the CARBON claims cover ground referred to as Goddell's claims (Wheeler, 1961, pp. 133-134). The properties were re-examined in the 1960's by Yukon Antimony Corporation Limited (Green, 1966, pp. 52-55).

Description:

Stibnite-rich quartz veins occur in east- to northeast-trending, vertical to steeply north-dipping shear zones cutting granodioritic rocks of the Coast Range intrusions (Unit 8, Wheeler, 1961).

Current Work and Results:

Geological mapping and a VLF-EM survey were carried out on the DIANE claims in 1976.

Whitehorse Copper Mines Limited

Copper, Silver, Gold
105 D 10, 11
(60°33'N to 60°45'N,
134°53'W to 135°10'W)

References: Kindle (1964); Green and Godwin (1964, pp. 33-39); Green (1965, pp. 40-41; 1966, pp. 50-51); Findlay (1967, pp. 41-43; 1969a, pp. 49-54); Hilker (1967); Craig and Laporte (1972, pp. 110-111); Sinclair and Gilbert (1975, pp. 74-76); Sinclair *et al* (1975, pp. 142-143); Sinclair *et al* (1976, pp. 99-101).

Claims: Approximately 700 claims in the Whitehorse Copper Belt

Location and Access:

The properties are located along a north- to northwest-trending belt, up to four miles (7 km) wide and 20 miles (35 km) long, lying west of Whitehorse. Access to the property is provided by various mine roads connected to the Alaska Highway. Copper concentrates are shipped by rail to Skagway.

History:

Copper showings in the Whitehorse area were known at least as early as 1897 and most of the known occurrences were staked in the period 1898 to 1899 by miners enroute to the Klondike. Some production took place up to 1920 and subsequent exploration on the Copper Belt included diamond drilling by Richmond Yukon Company Limited in 1927 and Noranda Exploration Company Limited in 1947 and 1948.

In 1955, Imperial Mines and Metals commenced exploration in the area and started drilling on the Best Chance prospect in 1956. In 1957, the company was renamed New Imperial Mines Limited. By 1965, the company had outlined roughly 4.6 million tons of ore grading 1.17 per cent copper and milling began in 1967. Since then, there has been production from six open pits: Little Chief, Arctic Chief East and West, Black Cub, Keewenaw and War Eagle.

Production was suspended in June 1971 due to low metal prices and was resumed in December 1972 from underground mining of the Little Chief ore body. The company was renamed Whitehorse Copper Mines Limited in September 1971.

Description:

Copper occurrences of the Whitehorse Copper Belt are in calc-silicate-magnetite skarns developed along the irregular contact between Triassic Lewes River sediments (Unit 3c, Wheeler, 1961) and Cretaceous granodioritic to dioritic intrusions of the Coast Intrusions (Unit 8, op. cit.). The skarns are best developed in massive limestone of the Lewes River Group and consist of varying amounts of diopside, epidote, tremolite-actinolite, garnet, serpentinite, magnetite and/or hematite and, occassionally, asbestos. The primary ore minerals are bornite and chalcopyrite with minor amounts of chalcocite and native copper. Valleriite, a relatively rare copper sulphide, is locally abundant but mill recovery is poor because of its physical properties.

Current Work and Results:

Production in 1976 was 800,836 tons grading 1.69 per cent copper, mainly from the Little Chief ore body. The ore also contained an average of 0.3 ounces of silver per ton and 0.025 ounces of gold per ton.

OPERATING SUMMARY, 1974-1976

	1976	1975	1974
Tons Milled	800,836	737,062	626,541
Rates (tons/day)	2,780	2,030	1,745
Grade (%Cu)	1.69	1.52	1.84
Reserves (tons)	2,700,648	3,054,897	3,567,980

Surface exploration in 1976 was carried out on the North Star and Arctic Chief properties in the Copper Belt. Two holes totalling 1,901 feet (580 m) were drilled on the North Star property. Both holes intersected calc-silicate-magnetite skarn similar to that found in the Little Chief ore body but only traces of copper sulphides were encountered. One diamond drill hole 697 feet long (220 m) was drilled south of the Arctic Chief East pit. Skarn was encountered over more than 500 feet (150 m) but only traces of chalcopyrite were encountered locally.

KREFT-TAKACS PROPERTY
Whitehorse Copper Mines Limited

Copper
105 D 11
(60°41'N, 135°22'W)

References: Wheeler (1961); Craig and Milner (1975, p. 52); Sinclair *et al* (1975, pp. 143-144; 1976, pp. 101-104).

Claims: GROUSE 1-16; ROY 1-8; WOLF 1-6; LUNAR 1-8; APEX 17-18, 23-24; PANTHER 1; GEAR 1-6; JAKE 1,2

Location and Access:

The property is located on the north side of Jackson Creek roughly 11 miles (18 km) west of Whitehorse. Elevations range from 3,200 to nearly 5,500 feet. Access is via a summer tote road from the Fish Lake-Jackson Creek road.

History:

The property was staked in 1969 by S. Takacs and E. Kreft. The property was optioned by New Jersey Zinc Corporation who drilled six holes totalling 1,500 feet (450 m) in 1972. In 1974 the property was optioned by Whitehorse Copper Mines Limited who drilled six holes totalling 1,401 feet (427 m) in 1975.

Description:

The property is underlain by Upper Triassic Lewes River Group sediments (Unit 3, Wheeler, 1961) to the northeast intruded to the southwest by granitic rocks of the Coast Intrusions (Unit 8, op. cit.). Skarn assemblages of actinolite, diopside, magnetite, and calcite with minor wollastonite, serpentine, chlorite and epidote occur in massive limestone and limy clastics of the Lewes River Group at their contact with hornblende granodiorite. Disseminated and patchy chalcopyrite associated with secondary malachite, azurite and chrysocolla occur in actinolite-magnetite skarn.

Current Work and Results:

In 1976, four holes totalling 1,550 feet (470 m) were drilled in the vicinity of the holes drilled in 1975. One hole, 100 feet northwest of the 1975 hole which intersected 20 feet of 5.60 per cent copper and 7.93 ounces per ton silver, encountered very low grade copper mineralization. A hole 200 feet southeast of this hole intersected 1.3 feet of 2.55 ounces per ton gold and 5.8 per cent bismuth. The other two holes encountered no mineralization. The option was subsequently dropped.

AU, BRIE
Utah Mines Limited

Lead, Zinc, Copper
105 F 14
(61°51'N, 133°14'W)

Reference: Gabrielse (1963); Sinclair *et al* (1976, pp. 112-113); Tempelman-Kluit *et al* (1977); Norman *et al* (1977).

Claims: AU 1-6; BRIE 1-128

Location and Access:

The AU and BRIE lie within the St. Cyr Range of the Pelly Mountains on the south side of Fox Creek, roughly 26 miles (41.6 km) southwest of Ross River. The area is characterized by high relief with elevations on the property ranging from 4,000 to 7,000 feet. Access to the claims is by helicopter from Ross River, or from the Canol Road, 9 miles (14 km) to the east. The claims can also be reached by foot from a cat trail on the north side of Fox Creek.

History:

The property was originally staked as the TUB claims by P. Risby in 1971. Arrow Inter-America Corporation optioned the claims and carried out prospecting and geochemical surveys in 1972. The property was restaked as the AU claims by Mr. Risby in 1975 and subsequently optioned to Utah Mines Limited who carried out some prospecting and geochemical surveys later in the year.

Description:

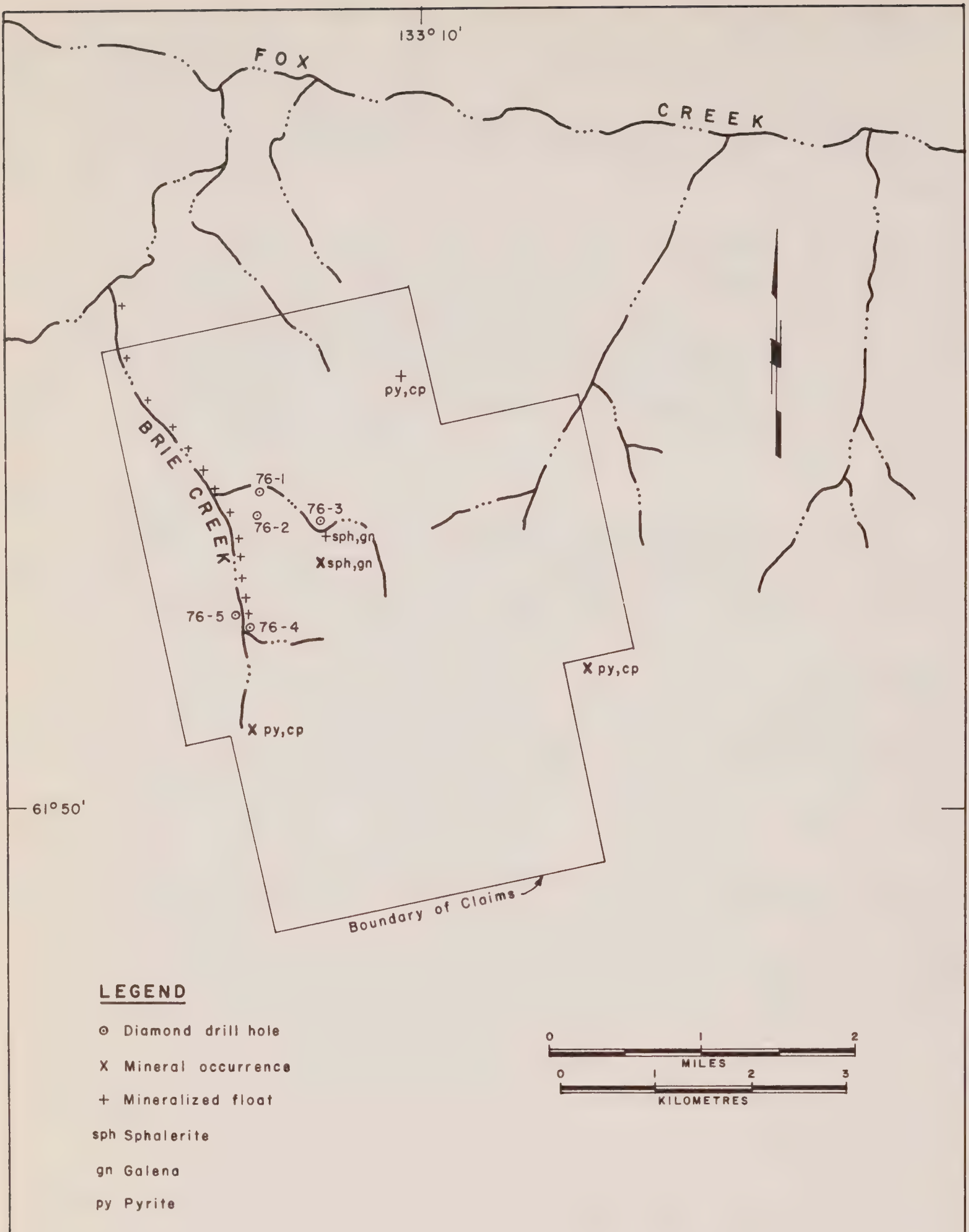
The property lies within a miogeoclinal succession of shale, sandstone, carbonate and volcanic rocks ranging from Proterozoic to Triassic in age (Tempelman-Kluit *et al*, 1977). This succession is cut by post-Triassic imbricate thrust faults directed to the northeast and intruded by mid-Cretaceous granitic batholiths.

According to Norman *et al* (1977), the property is underlain mainly by up to one thousand metres of Cambro-Ordovician strata equivalent to the Kechika Group of Gabrielse (1963). They consist of calcareous, orange-weathering phyllite with numerous volcanic tuff lenses. Phyllitic limestone and thin beds of dolomite also occur within the phyllite. A thin unit comprised of argillite, dolomitic siltstone and tuff of Lower to Middle Silurian age conformably overlies Kechika Group phyllite on the northern part of the property.

Intrusive rocks on the property consist of hornblende diorite and andesite dykes. The dykes generally trend 020° and vary from one to 5 m in width. They are probably related to mid-Cretaceous hornblende granodiorite which outcrops south of the property.

The phyllitic rocks are structurally complex and at least three phases of deformation have been recognized. The best developed deformation fabric is a crenulation foliation (F_2) which strikes northwest and dips 20-30° to the north. The crenulation foliation is superimposed on transposed bedding (F_1) which appears to have a random orientation. Foliation has also been observed striking north and dipping steeply to the east (F_3).

Mineralization was originally discovered in boulders in Brie Creek, a northflowing tributary of Fox Creek on the western side of the property. Mineralized boulders were subsequently found in Brie Creek from the 4,700-foot



LOCATION OF DIAMOND DRILL HOLES AND MINERAL OCCURRENCES, AU AND BRIE CLAIMS, WHITEHORSE MINING DISTRICT

1

elevation down to Fox Creek, size and angularity of the boulders increasing upstream. Two types of mineralized boulders are present:

1) Dark brown limonitic boulders composed mainly of quartz with minor carbonate. Mineralization consists of pyrite and minor chalcopyrite occurring in bands and in cross-cutting fractures.

2) White siliceous boulders containing banded sphalerite and traces of galena.

The best mineralization in outcrop occurs south of a west-flowing tributary of Brie Creek. It consists of galena, sphalerite and hydrozincite in a siliceous lens in phyllite, three to four feet thick and dipping 50° north. Small showings of pyrite and chalcopyrite also occur in siliceous lenses in phyllite and tuff. The sulphides are typically concentrated in the noses of small folds.

Current Work and Results:

Work by Utah Mines in 1976 consisted of geological mapping, geochemical and geophysical surveys and five diamond drill holes totalling 2,104 feet (640 m).

The geochemical surveys included soil and silt sampling and analysis for lead, zinc, silver and copper. Six zones with anomalous metal concentrations were outlined by soil sampling and two by silt sampling.

Geophysical surveys consisted of an electromagnetic survey, a gravity survey and a magnetometer survey. The electromagnetic survey outlined a large conductor in the central portion of the property. The gravity survey failed to locate any positive anomalies on the property. The magnetic survey indicated very little magnetic relief on the property.

Diamond drilling was carried out in the vicinity of Brie Creek and one of its tributaries to test the bedrock near the possible source of the mineralized boulders in Brie Creek, and to test the electromagnetic anomaly. The drilling failed to intersect any significant sulphide mineralization. The electromagnetic anomaly was caused by graphitic phyllite.

CIVI — 105 K 2
Mackir Mining Limited — (62°13'N, 132°56'W)

References: Tempelman-Kluit (1972); Sinclair *et al* (1975, p. 135).

Claims: CIVI 1-11

Location and Access:

The claims are situated 19.3 km east of Faro. Access in 1976 was by helicopter from Faro.

History:

The claims were mapped and soil sampled in 1974 (Sinclair *et al*, 1975) by Cream Silver Mines who optioned the property to Mackir Mining Limited in 1976.

Description:

Immediately south of the CIVI claims are outcrops of quartz-mica schist, phyllite and graphitic schist, with lenses of meta-tuff and green banded

chert. This sequence dips north at 15° to 20° beneath the CIVI group and is considered to be the same sequence as the Cambrian-Ordovician phyllites which host the zinc-lead ore deposits of the area (Unit 3, Tempelman-Kluit, 1972).

Current Work and Results:

A gravity survey over 17.7 line-kilometres at a station spacing of 30.5 m was conducted on the claims. Terrain corrections were not made to the data. Several gravity anomalies were outlined and further gravity surveying was recommended.

ANVIL MINE — Lead, Zinc, Silver
Cyprus Anvil Mining Corporation — 105 K 2, 3, 6
(62°21'N, 133°22'W)

References: Chisholm (1957); Roddick and Green (1961a); Green and Godwin (1964, pp. 31-32); Green (1965, pp. 36-37; 1966, pp. 47-50); Findlay (1967, pp. 35-39; 1969a, pp. 43-45; 1969b, pp. 29-30); Tempelman-Kluit (1972); Craig and Laporte (1972, pp. 94-96); Brock (1973); Sinclair and Gilbert (1975, pp. 50-52); Sinclair *et al* (1975, pp. 128-129); Sinclair *et al* (1976, pp. 115-116).

Claims: FARO, GAL, ED, SUN, RICH, DY, GALE, DEA, LEA, PEA, SEA, SB, DP, KAY, MOR, SINK, LO, TIE, ROCK, BILL: approximately 1,600 claims

Location and Access:

The Anvil Mine is situated 230 km northeast of Whitehorse in the Anvil Range. Ore concentrates are trucked to Whitehorse via roughly 402 km of all-weather roads and then transferred to the White Pass and Yukon Route for shipment by rail to Skagway.

History:

The mine was brought into production late in 1969 and, except for brief shutdowns due to labour problems, has been in continuous production since. In 1975, Anvil merged with Dynasty Explorations Limited to form Cyprus Anvil Mining Corporation.

Description:

The host rocks on the property consist of pelitic schist which are overlain by calc-silicate phyllite (Unit 2, Tempelman-Kluit, 1972). The regional trend of the schist and phyllite is to the northwest, with dips averaging 20° to the southwest. Locally, the structure is complex, with at least five stages of deformation recognized by company geologists. The ore occurs in a series of massive sulphide zones along a 6,600 foot strike length. The ore zones are tabular in longtitudinal section and lenticular in cross section and are generally conformable to the enclosing schist and phyllite host rocks. Galena and sphalerite, associated with pyrite and pyrrhotite, are the principal sulphide minerals.

Current Work and Results:

Additional gravity and Turam surveys were conducted and some of the claims were geologically mapped on scales of 1 inch = 200 feet and 1 inch = 1,000 feet. A new geological map for the Anvil Range was completed for company use.

The 1976 diamond drilling program consisted of 25 holes totalling 25,000 feet (7,620 m). On the DY claims a 200-foot section of banded and massive sulphides, identical to rock types found on the edge of the GRUM deposit, was encountered at a depth of 2,000 feet (610 m). Assays were not of economic grade but further drilling is planned. Immediately northeast of the Anvil Mine drilling failed to produce additional reserves, but low grade lead-zinc sulphides were intersected on the SB group under Swim Lake.

OPERATING SUMMARY - 1973-1976

	1976	1975	1974	1973
Tons Milled	1,675,381	3,225,083	2,925,359	2,899,124
Daily rate (tons)		8,983	8,865	7,942
Mill Heads:				
Lead (%)	2.66	9.44)	10.11)	11.25)
Zinc (%)	5.48	combined)	combined)	combined)
Silver (oz/ton)	1	1	1	1
Ore reserves (tons)	44,700,000	46,400,000	49,674,000	52,599,000

Annual Report 1976.

VANGORDA OPTION
Canadian Natural Resources Limited
Vangorda Mines Limited

Lead, Zinc, Silver
105 K 3
(62°12'N, 133°15'W)

References: Tempelman-Kluit (1972); Sinclair et al (1974, p. 130; 1975, p. 122).

Claims: WYNNE 6-8; ALICE 1-8; ROCKY 1,3,5,7,8; JACK 1-5; CHAMP 1-8; ELLE MAY 3,4; BIZ 2-3; HIW 1-4 fr; HANK 2-3 fr; SALLY: a total of 38 claims

Location and Access;

The claims are located 9.7 km north of Faro and access is by gravel road that leads from the Anvil Mine road to the GRUM deposit.

History:

The claims were staked in the early 1950's at the time of the Vangorda Creek sulphide discovery. They are located just south of the GRUM deposit and are being explored as part of the intensive exploration around the deposit.

Description:

The area is underlain mainly by greenish-grey, chlorite-muscovite-quartz phyllite, locally graphitic and of probable Cambrian age (Unit 3, Tempelman-Kluit, 1972).

Current Work and Results:

Seven BQ diamond drill holes were sunk, for a total footage of 5,113 feet on the CHAMP 1, 2, 7; ROCKY 8; and ALICE 1 claims. No significant mineralization was found. The claims were mapped geologically at a scale of 1 inch = 400 feet and Turam and gravity surveys were run over some of the claims.

LOWER ANVIL CREEK
Cyprus Anvil Mining Corporation
Preussag Canada Limited

105 K 5
(62°27'N, 133°48'W)

References: Roddick and Green (1961a); Tempelman-Kluit (1972); Sinclair and Gilbert (1975, p. 56).

Claims: LORNA 1-40; ARO 1-40 50, 59; GRAN 1-6, 13-24; ROTO 17-50

Location and Access:

The claims are located along lower Anvil Creek about 24 km northwest of Faro. Access is by helicopter from Faro.

History:

The claims were staked in 1970 following airborne magnetic and EM surveys. The claims have been mapped and one 576 foot hole was drilled.

Description:

The claims are situated in the same stratigraphic package that contains the Faro-Vangorda deposits. In particular, the claims are underlain by calcareous phyllite and calc-silicate unit rocks with some graphitic conductors indicated.

Current Work and Results:

Gravity and Turam surveys were conducted on the ROTO, LORNA and ARO groups. A number of weak coincident Turam and gravity anomalies were located.

EVA, MABLE, WYNNE, IRENE
Welcome North Mines Limited
Getty Mining Pacific

105 K 5, 6
(62°23'N, 133°02'W to
(62°28'N, 133°48'W)

References: Roddick and Green (1961a); Tempelman-Kluit (1972); Sinclair *et al* (1976, p. 116).

Claims: EVA 1-47; MABLE 1-48; WYNNE 1-42; IRENE 1-56

Location and Access:

The claims are situated in separate blocks in the Anvil Range within a northwest trending strip roughly 40 miles long. Access to the WYNNE group was by helicopter and by a cat road from the Anvil Mine site to the other groups.

History:

The greater portion of claims were staked early in 1975; the rest were staked during the following summer.

Description:

The claim groups are all considered to be underlain by schist and phyllite mapped as Unit 3 by Tempelman-Kluit (1972). Locally, the schist and phyllite are intruded by granodiorite of Cretaceous age. No sulphide mineral occurrences have been reported.

Current Work and Results:

A program of diamond drilling, geological, geochemical and geophysical surveys were conducted on the claims. Soil geochemical surveys were carried out on the MABLE and WYNNE claim groups, as was geological mapping at a scale of 1 inch = 400 feet. Gravity surveys were conducted on the MABLE, IRENE and WYNNE groups. In addition, a Turam survey was conducted on the WYNNE group. No significant mineralization was encountered in the diamond drilling, though the favourable host horizons were identified by company geologists in all the holes.

Summary of diamond drilling:

Claim	No. of Holes	Total Footage	Size
MABLE 29, 43, 45	3	2,819	BQ
EVA 13, 18, 20	3	2,740	BQ
IRENE 33, 39	2	1,293	BQ
WYNNE 3, 42	2	1,557	BQ

GRUM — Lead, Zinc, Silver
Kerr Addison Mines Limited — 105 K 6
Canadian Natural Resources — (62°15'N, 133°10'W)

References: Chisholm (1957); Green and Godwin (1964, p. 31); Tempelman-Kluit (1972); Sinclair et al (1975, pp. 130-131; 1976, pp. 122-123).

Claims: GRUM 1-3, 5; CHUCK 1, 2, 6-8; HANK 4-6; FIRTH 6,8

Location and Access:

The property lies roughly five miles northeast of Faro and straddles the Vangorda-Swim Lakes Road which provides ready access.

History:

The property was originally staked and explored in the period 1953-55 at which time two small sulphide zones designated the Champ and Firth were discovered west of the Vangorda deposit. In 1973, AEX Minerals Corporation optioned the property and drilled four holes, one of which intersected a section of massive sulphides carrying lead and zinc. In 1974, Kerr Addison drilled 60 holes totalling 55,784 feet, outlining a massive sulphide zone containing a minimum of roughly 30 million tons of 10 per cent combined lead-zinc and nearly 2 ounces of silver per ton. Late in 1974, AEX Minerals Corporation merged with 79902 Resources to form Canadian Natural Resources.

Description:

Although outcrop in the immediate area of the deposit is lacking, the property is generally underlain by chlorite-muscovite schist and phyllite assigned to Unit 3 of probable Cambrian age by Tempelman-Kluit (1972). Detailed mapping by Cyprus Anvil geologists in the area of the Faro ore body indicates that the host rocks for the massive sulphides belong to Unit 2 of Cambrian age or older.

The host rocks of the GRUM deposit consist of black, graphitic phyllite and white, sericite-quartz phyllite. The latter has a tendency to form haloes around sulphide zones. These rocks are overlain by green, chlorite-

sericite-quartz phyllite and grey, sericite-quartz phyllite which form the hanging wall of the deposit. The footwall rocks consist of biotite-muscovite phyllite, probably in fault contact with underlying garnet-biotite-staurolite schist. The host rocks are characterized by complex internal deformation dominated by pervasive foliation trending northwest and dipping 20° to the southwest.

The deposit is roughly elliptical in shape with a gently northwest-plunging axis over 5,000 feet long and a gently southwest-dipping axis of 1,200 feet. In gross aspect, the deposit appears to be generally conformable to the dominant foliation of the host rocks. The ore zones consist of a series of massive sulphide lenses and mineralized phyllite separated by weakly to non-mineralized host rocks. Individual ore zones vary from a few feet up to 300 feet thick.

The principal ore minerals are sphalerite and galena with minor chalcopyrite, generally associated with pyrite. Minor amounts of pyrrhotite, magnetite and arsenopyrite are present in massive sulphide sections. White barite is in sections of rich ore and appears to increase to the northwest. The massive sulphides tend to be finely banded and very fine-grained, although texture and grain size are variable.

Current Work and Results:

The program of underground drilling and drifting was completed. A preliminary feasibility study by G.M. Hogg and Associates on behalf of Canadian Natural Resources indicates that as of November 29, 1976 there was 29,705,000 tons grading 4.34 per cent lead, 6.76 per cent zinc and 1.91 ounces per ton silver in the main deposit. In addition, 8,818,000 tons are estimated to the west of the 29,705,000 ton section. The total reserves are therefore calculated to be 38,523,000 tons. Additional engineering, metallurgical and feasibility studies are expected to be completed by the end of 1977.

RAZ	Zinc, Lead, Silver
Welcome North Mines Limited	105 K 6
Getty Mining Pacific	(62°19'N, 133°02'W)

References: Roddick and Green (1961a); Tempelman-Kluit (1972); Sinclair *et al* (1976, p. 116).

Claims: RAZ 1-20

Location and Access:

The claims are located 19 km northeast of Faro at an elevation of 5,500 feet and 1.6 km northeast of Mt. Mye. Access to the claims is by helicopter from Faro or Ross River.

History:

The claims were staked in 1975.

Description:

The claim group is probably underlain by schists and phyllites mapped as Unit 3 by Tempelman-Kluit (1972). Granodiorite of the Anvil Batholith is also found on the property. The only sulphide discovered so far is in mineralized float.

Current Work and Results:

A geochemical survey for copper, lead, zinc, cadmium and silver was conducted on the outflow areas of deeply circulating groundwaters. Rock geochemistry was utilized in some anomalous areas.

KO
Mackir Mining Limited

Lead, Zinc
105 K 6
(62°20'N, 133°20'W)

References: Findlay (1967, pp. 40-41); Tempelman-Kluit (1972); Sinclair and Gilbert (1975, pp. 52-53).

Claims: KO 1-36

Location and Access:

The property is situated 17.7 km northwest of Faro and 3.2 km southeast of the Anvil Mine. Access is via an 18.4 km tote road to the southwest corner of the property from the Faro road.

History:

The property was first staked as the A and KEN claims by Tay River Mines following the discovery of the Faro deposit. Geochemical, geological and ground magnetic and electromagnetic surveys were carried out, but the results were not encouraging and claims were allowed to lapse in 1973 when they were restaked as the KO group.

In 1976 Mackir Mining Limited optioned the property from Cream Silver Mines Limited.

Description:

The underlying rocks consist of Precambrian and (?) Cambrian calc-silicate skarn, biotite schist and muscovite-chlorite phyllitic schist (Unit 11, Tempelman-Kluit, 1972). Aside from minor pyrite and pyrrhotite, no significant mineral occurrences were located.

Current Work and Results:

Five gravity lines with 30.5 m station spacings were completed. No anomalies of interest were outlined but it was recommended that the remainder of the claim group be surveyed.

MING
Mackir Mining Limited

105 K 6
(62°25'N, 133°04'W)

References: Craig and Laporte (1972, pp. 96-97); Tempelman-Kluit (1972); Sinclair *et al* (1975, p. 129).

Claims: MING 1-16

Location and Access:

The claims are situated 22.5 km northeast of Faro and 54.7 km northwest of Ross River. Access in 1976 was by helicopter from Faro.

History:

Geological mapping and soil sampling were carried out on the property in 1974 (Sinclair et al, 1975) and no geochemical anomalies were found.

Description:

Outcrops in the west-central part of the claims consist of meta-tuffs and meta-andesites of Cambrian-Ordovician (?) age (Unit 3, Tempelman-Kluit, 1972). These rocks occur in the same sequence as the phyllitic rocks which host the zinc-lead deposits of the area. To the north, these rocks are overlain by basaltic flows of Pennsylvanian to Permian age (Unit 8, Tempelman-Kluit, 1972). No occurrences of sulphides have been observed on the property.

Current Work and Results:

A reconnaissance gravity line was run over the claims. The line was 1070 m long with a station spacing of 30.5 m. This survey was primarily designed as a preview to a more extensive survey in 1977.

NORTH ANVIL RANGE — Lead, Zinc, Silver
Cyprus Anvil Mining Corporation — 105 K 6, 7
Metallgesellschaft Canada Limited — (62°20'N, 133°00'W)

Reference: Tempelman-Kluit (1972).

Claims: AM, FAT, FIN, JET, LISA, MX, SARK, TAF, TIM, ZAN: A total of 400 claims

Location and Access:

The claims are situated north of the Anvil Batholith about 13 km from the Anvil Mine. Access is by helicopter from Faro.

Description:

The claims are underlain by a variety of rock types which include, from oldest to youngest, a high grade metamorphic schist of siliceous to pelitic compostion lying adjacent to the Anvil Batholith, the Faro sequence, a calc-silicate unit, and pelitic phyllites with marked graphitic horizons. Overlying this sequence of rocks is the KD volcanic package of rocks.

Current Work and Results:

Gravity and Turam surveys were conducted on the claims.

CAT — 105 K 7
Preussag Canada Limited — (62°15'N, 133°00'W)

Reference: Tempelman-Kluit (1972).

Claims: CAT 1-64

Location and Access:

The claims are located on Blind Creek about 14.5 km above its confluence with the Pelly River. Access is by helicopter from Faro, 19 km to the west.

History:

In the 1964-65 staking rush in the Anvil District the area of the CAT claims was covered by the LUK group. Airborne magnetic and EM surveys were carried out in 1966. The present claims were staked in 1974 for Norex Developments Limited (NPL) and limited line-cutting and trenching was carried out in 1975. In 1975 the claims were optioned to Afrex Gas and Oil Limited who re-optioned the claims to Preussag Canada Limited.

Description:

Glacially-derived material covers most of the claim block except for some ridges and steep hillsides. The claims are underlain by the Anvil series of schists and phyllites with the contact between the biotite schist unit and chlorite phyllite unit transecting the claim group. The valley of Blind Creek follows the trace of a normal fault.

Current Work and Results:

Work on the property consisted of line cutting, geological mapping, a magnetometer and Turam EM survey, and a soil geochemical survey for Pb, Zn, and Cu. Further work was recommended.

A,B — 105 L 9
Swim Lake Mines Limited — (62°10'N, 134°05'W)
Canadian Natural Resources Limited

Reference: Campbell (1967); Sinclair *et al* (1975, p. 12).

Claims: A 1-32; B 1-16

Location and Access:

The claims are located on the western flanks of Tay Mountain at the headwaters of Fishook Creek. Access is by helicopter from Faro, 64 km to the southeast.

History:

The A claims were staked in June 1975 and the B group in November 1975. The claims were optioned to Canadian Natural Resources Limited in 1976.

Description:

The claim group is underlain by a recumbently-folded sequence of black graphitic phyllite; a grey-green quartz-muscovite biotite schist; a chlorite ± biotite ± andalusite schist; a green-speckled amphibolite associated with a meta-tuff unit; and a black and white limestone unit ± calc-silicate minerals. On Tay Mountain these units have been intruded by a medium-grained granite. The rocks are metamorphosed by the granite and cordierite and andalusite isograds are present in the phyllite and biotite schist unit. The limestone unit shows development of the calc-silicate minerals garnet, idocrase, diopside, tremolite and wollastonite close to the granite

Current Work and Results:

The property was mapped in detail at a scale of 1 inch = 400 feet with a detailed structural interpretation that showed the presence of three phases of folding. A soil geochemical survey for Pb and Zn was conducted. A zone of

Pb-Zn anomalies parallels the south-arm of Fishook Creek overlying the black graphitic phyllite unit and coincident with a residual gravity anomaly. It has been recommended that this anomaly be drilled to some depth as the gravity interpretation suggests the source of the anomaly to be at a depth of about 540 feet (162 m).

SUE — 105 L 10, 14, 15
MacMillan Joint Venture — (62°48'N, 135°00'W)

References: Campbell (1967); Findaly (1967, p. 34); Sinclair *et al* (1976).

Claims: SUE - a total of 955 claims

Location and Access:

The claims form a single west-northwest trending block between the Pelly and MacMillan rivers, centred roughly 38.6 km east of their junction. Access in 1976 was by fixed wing aircraft to Oz Lake from Whitehorse, 238 km to the south, or from Mayo, 96.5 km to the northwest. During the winter, supplies may be hauled in over a winter tote road from Pelly Crossing. This road, originally constructed in 1966 to Detour Lakes, was extended in 1975 to the main base camp at Oz Lake in the north central part of the claim group.

History:

Parts of the current property were staked by Conwest Exploration Company Limited in 1966 following the Anvil discovery. Work in 1966-1967 consisted of airborne magnetic and electromagnetic surveys followed up by ground magnetic and electromagnetic surveys and some diamond drilling. The property was restaked by Conwest in August 1974 as the SUE claims. The claims are currently held by the MacMillan Joint Venture, a consortium between Conwest and Essex Minerals Company Limited.

Description:

Outcrop on the property is scarce and geological data is generally lacking. According to Campbell (1967) the property straddles the Tintina Fault which strikes roughly northwest. Northeast of the fault the property is underlain by volcancics and sediments of the Proterozoic to Paleozoic Anvil Range Group (Unit 15, Campbell, 1967). Silurian (?) and Devonian (?) sediments (Unit 15, op. cit.) occur southwest of the fault on the southwestern boundary of the property. Although occurrences of copper mineralization have been reported from the general area, no showings have been described on the property itself.

Current Work and Results:

A detailed gravity survey consisting of 54 line-kilometres with stations at 30.5 m intervals was completed during 1976. Twelve gravity anomalies were outlined.

PICKHANDLE
Western Mines Limited

Copper
115 F 16
(61°53'N, 140°20'W)

Reference: Muller (1967); Sinclair *et al* (1976, pp. 130-131).

Claims: M 1-14, 19-61

Location and Access:

The claims are situated two to three miles south of Pickhandle Lake on the northeast slope of the Kluane Ranges between elevations of 2,250 and 4,500 feet. Access is by helicopter, by a winter road from Mile 1151 (KM 1852) of the Alaska Highway or by boat along the Koidern River to small lakes near the northern corner of the property.

History:

The property was originally staked as the MM and GG claims by P. Versluce in 1968. In 1973 these claims lapsed and a portion of them were restaked as the M claims by Mr. Versluce, who carried out trenching in 1973 and 1974. In 1975 Brascan Resources Limited optioned the claims and carried out geological mapping, prospecting and bulldozer trenching. In 1976 Brascan acquired control of Western Mines Limited, to whom all exploration properties were subsequently transferred.

Description:

The property lies immediately southwest of the Shakwak Trench and is underlain by volcanics and related sediments of the Permian Cache Creek Group (Unit 10, Muller, 1967). Detailed mapping by Western Mines has outlined seven units of Permain age, which in ascending stratigraphic sequence consists of: (1) cherty to limy argillite, black shale and fine-grained, andesitic tuff; (2) fine-grained, crystalline limestone and cherty limestone; (3) vesicular to amygdaloidal, locally pillowed andesite; (4) thinly-bedded, shaly argillite, chert and cherty argillite; (5) limestone with interbedded cherty layers and lenses; (6) coarse-grained adesitic and dacite tuffs; and (7) a thick sequence of dacite to andesitic agglomerate and breccia with interbedded chert and shaly argillite. An eighth map unit consists of an aphanitic to fine-grained felsic volcanic rock which may either overlie or intrude the andesitic and dacitic tuffs. Unit 9 is a serpentinized peridotite sill averaging 100 feet (30 m) wide which intrudes the upper part of the volcanics and is believed to be Triassic in age.

Structure of the rocks underlying the property is dominated by isoclinal folding which trends northwest and is inclined to the southwest. Small scale isoclinal folds and subparallel faults have resulted in repetition of rock units within the property boundaries.

Regional metamorphism to low-grade greenschist facies has resulted in schistosity and shearing roughly parallel to bedding. Veins and stringers of quartz ± calcite ± epidote occur along fractures and shear planes at high angles to the foliation are believed to be related to hydrothermal activity which caused serpentinization of the peridotite.

Copper showings on the property are mainly vein sulphide occurrences consisting of chalcopyrite associated with varying amounts of pyrite, pyrrhotite, quartz, calcite and epidote. The veins occur in narrow shear zones and fractures cutting Permian volcanics and sediments and are especially prominent

in a mineralized zone within a lower andesite flow and an upper coarse-grained andesitic tuff.

Current Work and Results:

Field work in 1976 consisted of detailed geological mapping and a magnetic survey. At the end of July 1976, Western terminated their option agreement on the M claims.

ML
Mitsubishi Metal Corporation

Copper, Molybdenum, Uranium
115 H 7
(61°18'N, 136°55'W)

References: Cairnes (1909, in Bostock, 1957, pp. 281-282); Findlay (1969, p. 28); Tempelman-Kluit (1974b, pp. 73-74).

Claims: ML 1-15

Location and Access:

The claims lie roughly one-half mile (800 m) east of the Aishihik Lake road, immediately northeast of Hopkins Lake. Elevations on the claims range from 3,500 to 4,500 feet.

History:

Copper occurrences on the property were known at least as early as 1907 (Cairnes, 1909). In 1968, Mitsubishi Metal Corporation staked the property as the AD claims and carried out airborne geophysical surveys, soil sampling surveys and detailed geological and prospecting programs. The property was restaked by Mitsubishi as the ML claims in 1975.

Description:

The property is underlain by schist, gneiss, quartzite, slate and limestone of the Yukon Group which have been intruded by granitic and granodioritic rocks of Triassic (?) age, and andesitic and porphyritic dykes of probable Tertiary age.

Mineral occurrences on the property consist of 1) chalcopyrite in epidote and garnet skarn developed at the contact of granodioritic rocks and limestone bands in the Yukon Group; 2) locally disseminated molybdenite in granodioritic rocks; and 3) chalcopyrite associated with quartz and carbonate at the contact between Yukon Group and granodioritic rocks.

Current Work and Results:

In October, 1975 a sample of a pegmatitic phase of the granodiorite was taken which assayed 0.124 per cent U_3O_8. In 1976, a reconnaissance survey consisting of a scintillometer survey and a rock geochemical survey failed to outline any areas of anomalous uranium content. The results of the scintillometer survey indicated no anomalous radioactivity, total counts per second all falling in the range 80-180. Thirty-nine rock samples collected from the property all assayed less than 0.001 per cent U_3O_8.

BUN
Archer-Cathro (Ukon Joint Venture)

Uranium
115 H 8
(61°20'N, 136°28'W)

Reference: Tempelman-Kluit (1974b).

Claims: BUN 1-24

Location and Access:

The claims are located about 104 km northwest of Whitehorse, 13 km east of Long Lake. Access was by helicopter from Whitehorse or Haines Junction.

History:

The claims were staked in May and June 1976 for Ukon Joint Venture, managed by Archer-Cathro and Associates Limited.

Description:

The claim group is underlain by a large Triassic quartz monzonite stock on which is developed a regolith. The regolith is capped by Eocene volcanic flows. Radioactive zones are associated with the regolith-volcanic contact where some yellow coatings that may be secondary uranium minerals have been observed.

Current Work and Results:

A scintillometer survey was carried out using a Scintrex BGS-1SL broad band scintillometer. In addition, soil, silt, rock and water samples were analyzed for uranium.

HUESTIS MINE
Mount Nansen Mines Limited

Gold, Silver, Lead, Zinc
115 I 3
(62°03'N, 137°09'W)

References: Bostock (1936a); Green and Godwin (1963, pp. 23-24; 1964, pp. 26-28); Green (1965, pp. 32-34; 1966, pp. 34-38); Campbell (1965; 1966); Findlay (1967, pp. 30-31; 1969a, pp. 35-38; 1969b, pp. 23-25); Craig and Laporte, (1972, pp. 88-89); Tempelman-Kluit (1974a) Sinclair et al (1976, pp. 131-132).

Claims: Approximately 300 claims in the Mount Nansen area

Location and Access:

The Huestis Mine is situated 9.6 km southeast of Mount Nansen, roughly 48 km west of Carmacks and 116 miles northwest of Whitehorse. Access is via a 64 km gravel road which leaves the Carmacks-Freegold Road about one mile west of the Nordenskiold River bridge west of Carmacks.

History:

The Huestis veins were first staked by H.H. Huestis in 1947. Surface exploration was carried out between 1962 and 1964 by the Mount Nansen Exploration Syndicate and its successor, Mount Nansen Mines Limited. In 1965, an adit was collared at the 4,295 foot level and extensive underground exploration was carried out in 1965 and 1966. In 1967, a second adit was driven on the 4,100 foot level. From September 1968 until April 1969, the Huestis and

Webber veins were mined at an initial production of 70 tons per day and later 100 tons per day. Operations ceased largely as a result of the inability of the mill to obtain adequate gold recoveries without installation of a cyanide circuit. The mine was reopened in 1975 for rehabilitation and re-evaluation of the ore body.

Description:

Gold-silver vein structures up to 4 feet wide and dipping 85° to the northeast cut Proterozoic and/or Paleozoic schist and gneiss and highly altered feldspar porphyry plugs of Eocene age (Tempelman-Kluit, 1974a). The veins consist of quartz lenses containing arsenopyrite, pyrite, sphalerite, galena, stibnite and native gold. In addition, various silver-bearing minerals including freieslebenite, acanthite, native silver, andorite and argentiferous tetrahedrite have been identified (Green, 1966, p. 36).

Current Work and Results:

During 1976, the mine operated for ten months, producing a total of 8,196 tons at a rate of 28 tons per day. Underground developemnt work carried out on the 4,100 foot level consisted of 462 feet of drifting and 952 feet of raising. The mill was started up in June and operated for five months at a daily rate of 65 tons. A total of 6,429 tons were milled grading approximately 0.3 ounces per ton gold, 7 ounces per ton silver, 1 per cent lead and 1 per cent zinc. Operations at both the mine and the mill were terminated in October.

MALONEY CREEK — Copper, Molybdenum
Amax Potash Limited — 115 I 4
(62°01'N, 137°54'W)

References: Bostock (1936); Lodder and Godfrey (1970); Craig and Laporte (1972, pp. 76-78); Tempelman-Kluit (1974a,b); Tempelman-Kluit and Wanless (1975).

Claims: POT 1-48

Location and Access:

The property is situated on a west-flowing tributary of Maloney Creek in the southern part of the Dawson Range at elevations ranging from 3,000 to 4,100 feet. Access to the property is by helicopter from Carmacks, 88.5 km to the east.

History:

The area was probably prospected for placer gold in the early 1900's as evidenced by old cabins found along Maloney Creek by Bostock (1936). Bostock (op. cit.) also noted the presence of pipe and other steam-thawing equipment in a cabin on the nearby west fork of Schist Creek, although apparently little work had been done. In 1969 Amax Exploration discovered disseminated chalcopyrite and molybdenite in an area of anomalous geocehmistry and staked the POT claims. Amax subsequently conducted detailed geological, geochemical and geophysical surveys and carried out a limited amount of packsack drilling in 1970. No further work was carried out on the property until 1976, when the property was optioned by Western Mines Limited.

Description:

As is common in the unglaciated Dawson Range, the Maloney Creek property is obscured by up to 95 per cent overburden and much of the underlying bedrock is represented only by float. The property appears to be underlain mainly by schist and gneiss of the Yukon Metamorphic Complex which have been intruded by granodioritic to dioritic rocks of Mesozoic age and by a complex sequence of extrusive and subvolcanic rocks of Tertiary age. These rocks have been described in detail by Lodder and Godfrey (1970). Their distribution is shown on the accompanying map, which has been modified after Lodder and Godfrey (op. cit.).

Rocks of the Yukon Metamorphic Complex (Unit 1) consist mainly of quartz-mica schist, quartzite and gneiss. Gneissic texture or schistosity is generally well-developed and trends to the west to northwest. Aphanitic green chert and white massive recrystallized limestone are minor constituents of the Yukon Complex and banded epidote-garnet-diopside skarns are developed locally. The age of the Yukon Complex is uncertain but is considered by Tempelman-Kluit (1974b) to be Paleozoic or older.

In the southwestern corner of the property, Yukon Complex rocks are intruded by massive, equigranular granodiorite to diorite (Unit 2). The granodiorite is coarse-grained and contains biotite crystals up to 1 cm across. This unit is probably related to the Nisling Range granodiorite which is characterized by large euhedral biotite crystals (Tempelman-Kluit, 1974b). The Nisling Range granodiorite is Cretaceous according to K-Ar ages determined by Tempelman-Kluit and Wanless (1975).

Intermediate to acid volcanic and subvolcanic rocks (Unit 3) occur in the central and western parts of the property, mainly as small irregular stocks and dykes and, locally, as extrusive equivalents. These rocks vary considerably in texture and composition but are generally characterized by the presence of feldspar phenocrysts. Based on the detailed descriptions by Lodder and Godfrey (1970), they have been grouped into the five subdivisions shown on the accompanying map.

Unit 3e is fine-grained, dark green and commonly amygdaloidal. It is characterized by fine crystalline hornblende and feldspar and, locally, blue quartz eye phenocrysts up to 3 mm in diameter. It occurs as ring-shaped bodies and as northwest-trending dykes.

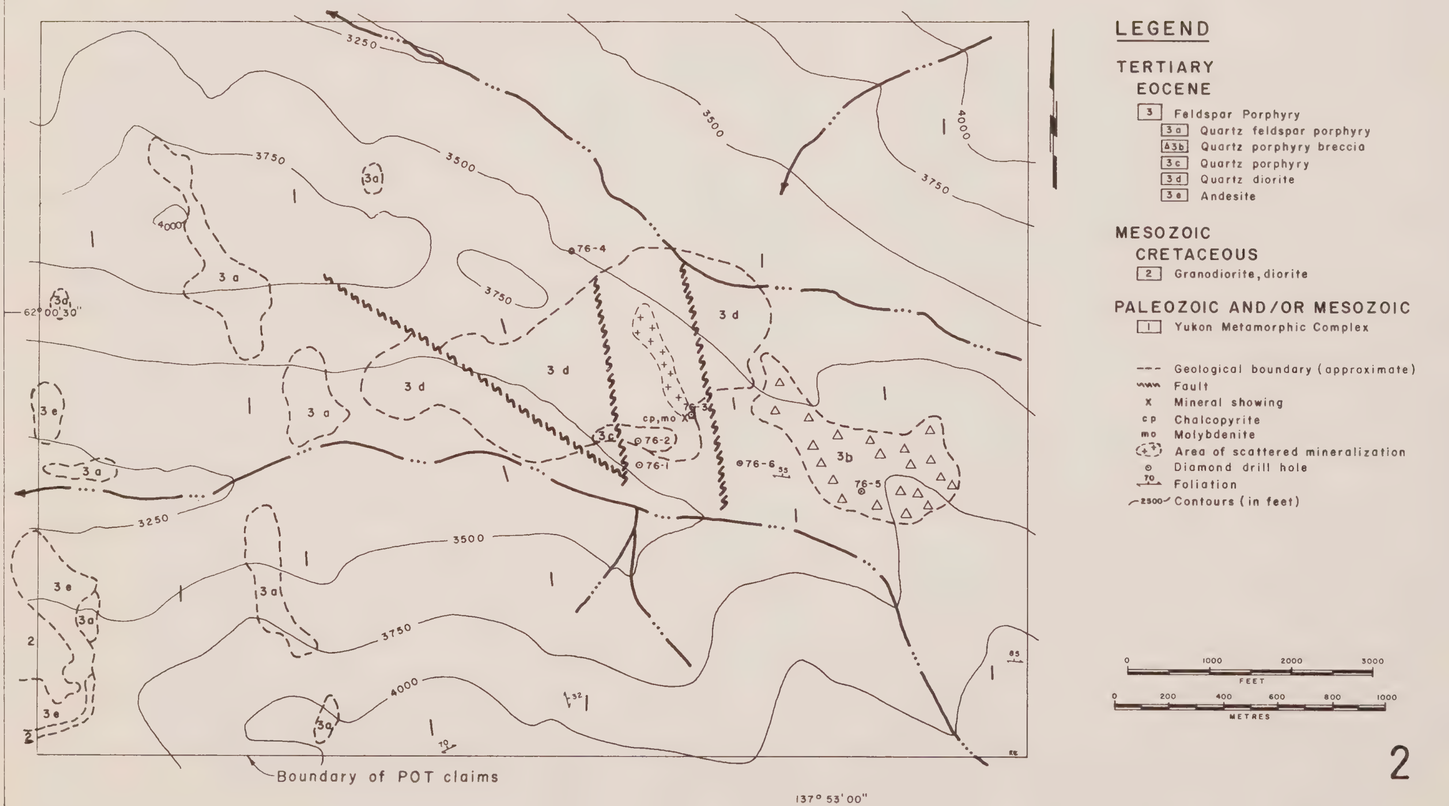
Porphyritic quartz diorite (Unit 3d) occurs in an elongated plug 1,500 by 600 m and trending roughly east-west in the centre of the property. The quartz diorite is characterized by coarse feldspar phenocrysts up to 1.5 cm long in a grey fine-grained matrix of quartz and feldspar. Biotite and amphibole phenocrysts averaging 4 mm in size constitute 5 to 15 per cent of the rocks. Quartz eyes up to 7 mm in diameter occur locally. Inclusions of Yukon Complex rocks are common in the quartz diorite.

A poorly exposed and poorly defined intrusive body of quartz porphyry (Unit 3c) occurs along the southern contact of the quartz diorite. Fresh specimens of the quartz porphyry consist of round quartz phenocrysts up to 3 mm in diameter set in a fine-grained, granular, chalky white quartzo-feldspathic groundmass. Normally, the quartz porphyry is strongly altered and leached and small vugs lined with jarosite and/or limonite are common.

Quartz porphyry breccia (Unit 3b) intrudes Yukon Complex rocks in an irregular shaped body east of the quartz diorite. The quartz porphyry breccia consists of broken quartz phenocrysts up to 1 cm in diameter and feldspar

GEOLOGY OF THE MALONEY CREEK PROPERTY

(Modified after Lodder and Godfrey, 1970)



2

phenocrysts up to 1.5 cm long in a grey, fine-grained quartzo-feldspathic groundmass. Angular fragments of Yukon Complex rocks up to 1 m across and small angular quartz fragments occur locally in the quartz porphyry matrix. Some large blocks of the Yukon Complex rocks occur within the breccia and results of the diamond drilling indicate that Yukon Complex rocks underlie a greater portion of the area than shown.

Quartz feldspar porphyry (Unit 3a) with a typical orange colour occurs in a north-south trending belt on the western half of the property. This unit is massive, with distinct, doubly-terminated quartz crystals and K-feldspar phenocrysts set in a very fine-grained groundmass.

The feldspar porphyry (Unit 3) is considered to be equivalent to the feldspar porphyry described by Tempelman-Kluit (1974b) which occurs in north-trending dyke swarms throughout much of the Dawson Range. The age of these rocks is Eocene according to age determinations by Templeman-Kluit and Wanless (1975).

A number of dykes intrude the different units on the property but are not shown on the accompanying map. The dyke rocks are generally fine-grained and range from rhyolitic to andesitic or basaltic in composition.

Structure on the property is dominated by two sets of faults or lineaments, one trending northwest and the other approximately north-south. The first set is indicated by the regional drainage pattern, by west- to northwest-trending folds and small faults in the Yukon Metamorphic Complex and by a northwest-trending fault. The second set is indicated by the north-trending belt of quartz feldspar porphyry (Unit 3a) and by two north-trending faults. The intersection of these two structural trends on the property may have affected the localization of the feldspar porphyry stocks.

Mineralized rocks on the property include quartz diorite, quartz porphyry, quartz porphyry breccia and adjacent Yukon Complex rocks. On surface, the best mineral showings occur near the southern edge of the quartz diorite and in a narrow zone of scattered exposures north of the main showing. Primary mineralization consists of chalcopyrite and molybdenite associated with pyrite and magnetite. However, most surface showings are strongly oxidized and leached and commonly consist of limonite and/or jarosite with malachite and azurite staining. Argillization of the feldspars and intense silicification are associated with the mineralization and well-developed quartz vein stockworks are developed locally. Potassic alteration consisting of K-feldspar envelopes along quartz veins occurs locally. Minor amounts of tourmaline and scheelite occur in a zone peripheral to the copper-molybdenum mineralization. Pyrite (up to 10 per cent) is best developed along the southern edge of the quartz diorite and up to 25 per cent magnetite occurs in quartz veins along the northern contact of the quartz diorite.

Quartz and molybdenite in hairline fractures and small amounts of disseminated pyrite and molybdenite occur locally in quartz porphyry breccia.

Numerous occurrences of jarosite and/or limonite found in quartz porphyry are the only evidence of the former existence of sulphides.

Mineral showings in Yukon Complex rocks consists mainly of quartz veins containing pyrite and locally chalcopyrite and/or molybdenite. Skarns in the Yukon Metamorphic Complex contain up to 10 per cent disseminated pyrite with minor amounts of chalcopyrite and/or molybdenite.

Supergene oxidation consisting mainly of jarosite and/or limonite is extensive and occurs to depths of 150 to 300 feet in bedrock. Small amounts of malachite, azurite and ferrimolybdite occur locally. Leaching, however, is limited as pyrite is present in the zone of oxidation. Results of the drilling carried out in 1976 failed to find any evidence for a zone of copper enrichment beneath the zone of oxidation.

Current Work and Results:

In 1976, Western Mines Limited drilled six holes totalling 2,427 feet (740 m). The drilling encountered copper-molybdenum mineralization of only sub-economic grades (less than 0.1 per cent combined copper and molybdenum) and Western subsequently terminated their option agreement with Amax.

ROC, JEN, SKUNK
Klotassin Joint Venture

Tungsten, Fluorite,
Copper
115 I 5, 6
(62°22'N, 137°25'W)

References: Craig and Laporte (1972, pp. 83-84, 87-88); Tempelman-Kluit (1974a); Sinclair *et al* (1976, pp. 136-137); Cathro (1976).

Claims: ROC 1-125; JEN 1-12; SKUNK 1-75

Location and Access:

The claims form a northwest-trending belt 16 km long and three km wide along the valley of Big Creek. The southeast end of the claims adjoins the Revenue Copper property 10 km northwest of Mount Freegold. Access in 1976 was by helicopter from Carmacks.

History:

The ROC claims were staked in December 1974, the JEN claims in January 1975 and the SKUNK claims in December 1975 for Klotassin Joint Venture, a consortium composed of Newconex Canadian Exploration Limited, Marietta Resources International Limited and Molycorp, Inc. Molycorp subsequently dropped out of the Joint Venture.

The ROC claims on the southeast end of the belt cover a portion of the lapsed COM claims, staked in September 1969 by Cominco, which carried out soil sampling and geological mapping in 1970. The SKUNK claims were staked to cover some lapsed KLAZAN claims, which were staked in 1965 by Coranex Limited and optioned to Atlas Explorations Limited in 1969. In 1970, Atlas carried out geochemical and geophysical surveys and drilled five holes totalling 670 m. In 1975, Klotassin Joint Venture conducted geological, geochemical and geophysical surveys on the ROC and JEN claims.

Description:

The geology of the ROC and JEN claims is described in Sinclair *et al* (1976). The only known mineral occurrences on these claims consist of minor banded and disseminated fluorite in quartz-rich schist on the south side of Big Creek, angular float from a gravel bar on Big Creek containing coarse grains of scheelite associated with quartz and minor fluorite and traces of malachite in schist exposed in trenches on the southeast end of the property.

According to Cathro (1976), the SKUNK claims are underlain mainly by a northwest-trending, lensoid body of feldspar porphyry up to 4,000 m long and

1,500 m wide. The feldspar porphyry is characterized by varying proportions of phenocrysts of quartz, feldspar, biotite and hornblende, with the quartz- and feldspar-rich varieties predominating. The feldspar porphyry is considered equivalent to the Feldspar Porphyry unit described by Tempelman-Kluit (1974a) which is Eocene in age.

Syenite, hornblende granodiorite and hornblende biotite granodiorite of the Mesozoic Klotassin Batholith occur around and, locally, within the feldspar porphyry. A small area within the feldspar porphyry is underlain by micaceous quartzite of the Yukon Metamorphic Complex.

Mount Nansen Group volcanics of Eocene age (Tempelman-Kluit, 1974a) consisting mainly of dark-coloured tuff and tuff breccia form a 25 m high terrace which extends for 1,500 m along the south side of Big Creek. The Mount Nansen Group volcanics are not common elsewhere on the SKUNK claims.

No mineral showings are known to occur on the SKUNK claims. Tourmaline occurs in feldspar porphyry float in one locality and some chlorite and clay alteration is developed in the feldspar porphyry although it is uncertain whether this alteration is of hypogene or supergene origin.

Current Work and Results:

Geological mapping, soil sampling and a magnetic survey were carried out by Klotassin Joint Venture on the SKUNK claims in 1976.

A number of copper-molybdenum and lead-zinc anomalies were outlined by the soil sampling but interpretation of these anomalies is rendered difficult because of thick overburden which covers a large portion of the property.

The magnetic survey helped to outline structure within the bedrock geology. A number of lineaments interpreted as faults were defined, including the Big Creek Lineament, a major lineament which trends northwest along the Big Creek Valley.

HI	Copper
United Keno Hill Mines Limited	115 I 6
Falconbridge Nickel Mines Limited	(62°29'N, 137°04'W)

Reference: Tempelman-Kluit (1974a).

Claims: HI 1-70, 71-78 Fr.

Location and Access:

The HI claims are situated on the west side of Big Creek roughly 9 miles (15 km) southwest of Minto. Elevations on the property range from 2,500 to 3,500 feet. Access in 1976 was by helicopter from Minto.

History:

The claims were staked in August 1976.

Description:

The property is underlain primarily by granodiorite to quartz monzonite of the Triassic Klotassin Batholith (Tempelman-Kluit, 1974a). Locally, these rocks exhibit foliation due to the alignment of mafic minerals, hornblende and

biotite. Narrow dykes of aplite and pegmatite intrude the Klotassin rocks. To the northwest of the property, the granodiorite is overlain by Eocene Carmacks Group volcanics.

Mineralization on the property consists of minor amounts of malachite restricted to a few narrow gneissic zones within granodiorite.

Current Work and Results:

Geological mapping and soil sampling were carried out on the property in 1976.

TINTA HILL
Tinta Hill Mines Limited

Zinc, Lead, Silver, Gold, Copper
115 I 7
(62°17'N, 137°00'W)

References: Bostock (1941, p. 26); Skinner (1961, pp. 35-36); Findlay (1969a, p. 34); Craig and Laporte (1972, p. 85); Tempelman-Kluit (1974a, b); Sinclair and Gilbert (1975, pp. 37-38); Sinclair *et al* (1975, pp. 121-122).

Claims: TINTA 1-26, 50-53, 55-56

Location and Access:

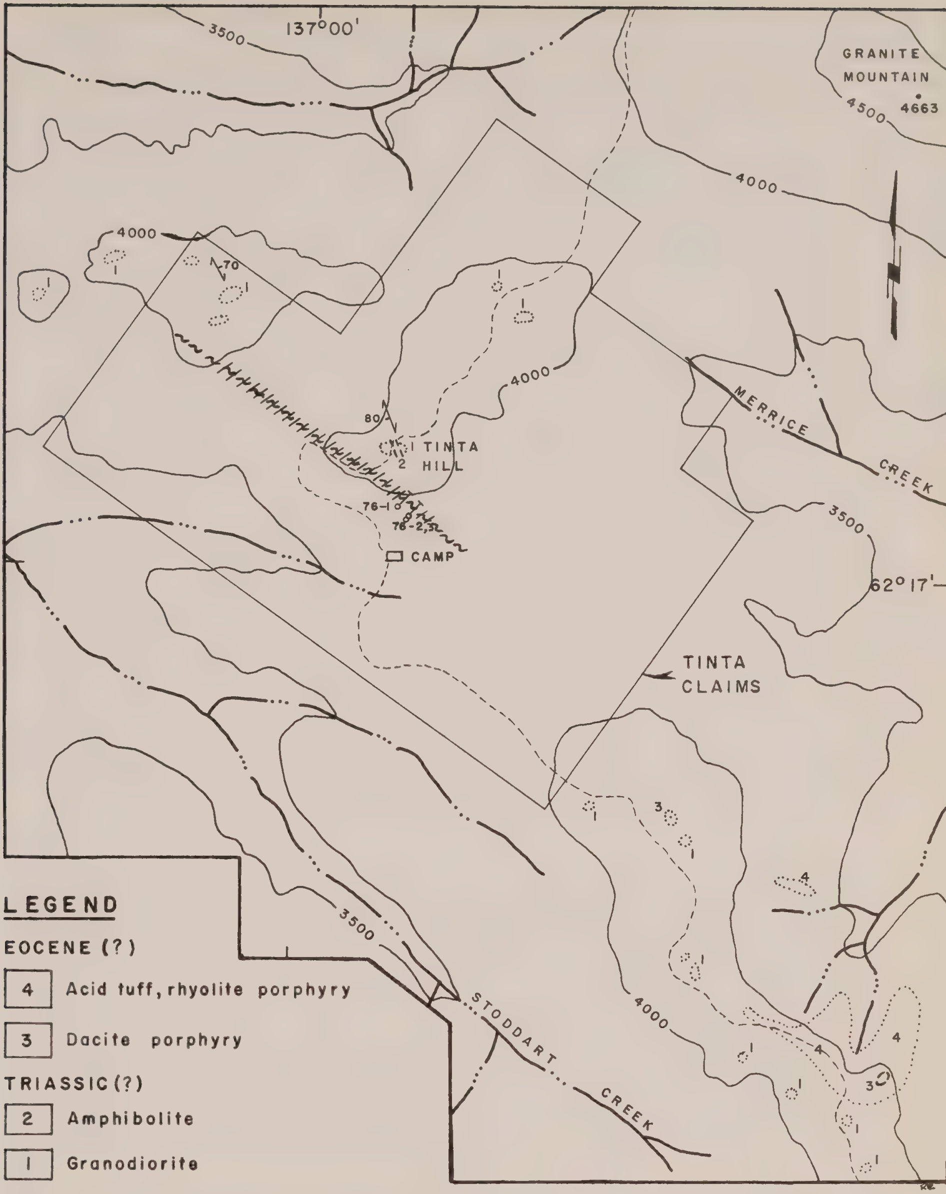
The property lies roughly 26 miles (42 km) northwest of Carmacks at the headwaters of Stoddart and Merrice creeks on the southern slope of Granite Mountain. The relief is gentle to moderate and elevations range from 3,300 to 4,100 feet (1,000 to 1,250 m). The property can be easily reached via a 7-mile (11-km) tote road which leaves the Mount Freegold Road at approximately Mile 33 (Km 52).

History:

The property was originally staked in 1930 to cover a mineralized quartz vein and was subsequently explored by trenching, shallow shafts and at least one adit which intersected a 22-foot (7-metre) vein (Bostock, 1941, p. 26). Conwest Exploration Company Limited staked the showing in 1959 and drilled 5 diamond drill holes totalling 1,349 feet (410 m) in 1960. Canex Aerial Exploration staked the property in 1966 and carried out an E.M. survey and a soil geochemical survey. The property was optioned in 1968 by Silgold Mines Limited who sampled the veins. Coin Canyon Mines acquired an interest in the claims in 1969 and conducted some soil sampling. The claims were returned to the original owner (renamed Canex Placer Limited in 1972) in 1973 and were subsequently optioned by Exeter Mines Limited who drilled 4 holes totalling 1,126 feet (340 m) late in 1973. Exeter drilled 21 holes totalling 4,041 feet (1,250 m) in 1974 and carried out a geochemical survey in 1975. In May 1975 Exeter Mines Limited was renamed Tinta Hill Mines Limited.

Description:

The general geology of the property and surrounding area is shown on the accompanying figure. The property lies within the unglaciated portion of the Dawson Range and bedrock is poorly exposed except along ridge tops. The principal rock type exposed on the property, shown as Unit 1, is granodiorite to quartz diorite of the Triassic (?) Klotassin Batholith (Tempelman-Kluit, 1974a). This rock is composed of 20 to 25 per cent quartz, 10 to 15 per cent K-feldspar, 40 to 50 per cent plagioclase and 10 to 15 per cent biotite and



LEGEND

EOCENE (?)

4 Acid tuff, rhyolite porphyry

3 Dacite porphyry

TRIASSIC (?)

2 Amphibolite

1 Granodiorite

Area of outcrop

Geological boundary (approximate)

70 Foliation

Shear zone

Mineralized zone

Diamond drill hole

Access road

4000 Contours (in feet)

0 1/2 1
MILES

0 1/2 1
KILOMETRES

GEOLOGY OF THE TINTA HILL AREA,
WHITEHORSE MINING DISTRICT

3

hornblende with abundant epidote and magnetite as accessories. It is medium- to coarse-grained and locally porphyritic due to the presence of K-feldspar phenocrysts up to 2 cm long. Foliation is commonly exhibited due to the subparallel alignment of mafic minerals trending roughly 330° and dipping steeply to vertically.

Unit 2 is medium- to fine-grained, gneissic amphibolite occurring as conformable bands up to 40 feet (12 m) thick within the granodiorite. The amphibolite consists of 60 to 70 per cent hornblende and 30 to 40 per cent plagioclase. Feldspar-rich bands 2 to 5 mm across occur at intervals of 2 cm or more. Unit 2 is prominent in outcrop at the top of Tinta Hill, immediately north of the main showing area.

Units 3 and 4 are volcanic rocks of Eocene (?) age exposed along ridge tops southeast of the property. Unit 3 consists of dacite to andesite porphyry which forms two small stocks up to several hundred feet across. One of these stocks, located one-half mile (0.8 km) east of the southernmost corner of the TINTA claim group, is composed of 5 per cent hornblende and biotite and 10 per cent plagioclase occurring as phenocrysts up to 2 mm long in an aphanitic, light-grey, feldspathic matrix. The second stock, one mile (1.6 km) to the southeast, is darker in appearance. The age of these stocks is uncertain, but they may be related to Mount Nansen volcanics of Eocene (?) age.

Unit 4 consists of rhyolite porphyry and vitric crystal tuff which are exposed in near-bedrock felsenmeer and scree along the southeast-trending ridge southeast of the property. The rhyolite porphyry is buff-weathering, chalky white and contains varying amounts of miarolitic cavities. It consists of quartz and plagioclase phenocrysts up to 2 mm across in an aphanitic white matrix. Trace amounts of disseminated pyrite are present. The tuff varies from white to purplish in colour. It contains crystal fragments of quartz, white, altered feldspar, and euhedral biotite up to 1 mm across in a very fine-grained and finely laminated matrix. This tuff is similar in appearance to the varicoloured acid tuff described by Tempelman-Kluit (1974b) in the Aishihik Lake area which have been assigned an Eocene or younger age.

Mineralization on the property occurs in quartz-carbonate veins confined to a 100-foot (30-metre) wide shear zone trending 335° and dipping vertically or steeply to the north in granodiorite and amphibolite. The quartz-carbonate veins have well-defined walls and vary from two to ten feet (0.5 to 3 m) wide. Mineralization occurs mainly in poorly defined zones as disseminated to heavily disseminated sulphides and, locally, irregular massive patches. The principal minerals are galena and sphalerite with minor amounts of chalcopyrite, tetrahedrite and pyrite. Minor amounts of chalcopyrite and pyrite are also disseminated in the wall rocks on both sides of the veins. Malachite and azurite occur in the oxidized portions of the veins. Alteration of the granodiorite in the vicinity of the veins is primarily sericitization and chloritization and, to a lesser degree, potash feldspathization and silicification.

Diamond drilling in 1973 and 1974 by Exeter Mines was conducted over a strike length of 4,000 feet (1,200 m) along the shear zone. The results indicated a mineralized zone roughly 3,500 feet (1,000 m) long containing 1,875 tons per foot grading 0.075 ounces per ton gold, 5.35 ounces per ton silver, 4.71 per cent lead, 6.03 per cent zinc, 0.37 per cent copper and 0.049 per cent cadmium. Electromagnetic surveys indicated that the shear zone extends for over 11,000 feet (3,300 m). Additional parallel and sub-parallel shear zones were also indicated.

Current Work and Results:

Three holes totalling 1,029 feet (310 m) were drilled in 1976 to test the vein at depth. Hole 76-1, drilled at -45° to the northeast encountered 9 feet (2.7 m) of heavy to disseminated mineralization from 396 to 405 feet (121.0 to 123.7 m). Hole 76-2 was abandoned at 80 feet (24 m) due to water loss and hole 76-3, collared 100 feet (30 m) southwest of 76-2 and drilled at -45° to the northeast, encountered 40 feet (12 m) of low-grade mineralization.

FED
United Keno Hill Mines Limited
Falconbridge Nickel Mines Limited
Canadian Superior Exploration Limited

Copper
115 I 11
(62°35'N, 137°05'W)

References: Sinclair and Gilbert (1975, p. 43); Sinclair *et al* (1975, p. 104).

Claims: FED 1-228

Location and Access:

The claims are situated on the west side of the Yukon River roughly 7 miles (11 km) west of Minto. Access in 1976 was by helicopter from Minto.

History:

The claims were staked in July 1973. Geological mapping and geochemical sampling were carried out in 1973 and 1974.

Description:

Minor malachite staining occurs along fractures in foliated granodiorite to quartz monzonite of the Triassic Klotassin Batholith.

Current Work and Results:

In 1976 an I.P. survey was conducted over a portion of the claim group immediately east of the adjacent COIN claims. A narrow linear anomaly was outlined parallel to the steep escarpment on the west side of the Yukon River valley. Company geologists attribute the anomaly to a clay layer in the deep alluvium in the area.

MINTO COPPER DEPOSIT
United Keno Hill Mines Limited
American Smelting and Refining Company
Silver Standard Mines Limited
Falconbridge Nickel Mines Limited
Canadian Superior Exploration Limited

Copper, Gold, Silver
115 I 11
(62°38'N, 137°15'W)

References: Tempelman-Kluit (1974a,b); Craig and Milner (1975, pp. 65-66); Sinclair and Gilbert (1975, pp. 39-42); Sinclair *et al* (1975, pp. 96-100).

Claims: MINTO 1-73, 75-97; DEF 1-89, 1379

Location and Access:

The adjoining MINTO and DEF claim groups are centred approximately 11.5 miles (18.5 km) west of the abandoned station of Minto and 48 miles (78 km)

north-northwest of Carmacks. Access is by boat along the Yukon River or by helicopter from Minto or Carmacks. A tote trail constructed in 1974 from Carmacks is currently suitable for winter travel only.

History:

The MINTO claims were staked by Silver Standard Mines Limited during the summer of 1971 to cover a copper anomaly in stream sediments. The DEF claims were staked shortly after by United Keno Hill Mines Limited who had discovered copper-stained outcrops to the north of the MINTO group. Until the end of 1974, work was carried out separately on the two properties. On the MINTO claims, Silver Standard and American Smelting and Refining Company (Asarco) carried out over 91,000 feet (28,000 m) of drilling in 139 holes and on the DEF claims, United Keno, Falconbridge and Canadian Superior drilled over 52,000 feet (16,000 m) distributed over 93 holes. The drilling outlined a mineralized zone containing approximately 7 million tons of 1.86 per cent copper and minor gold and silver which straddles the boundary between the MINTO and DEF properties.

Description:

The Minto copper deposit occurs within foliated granodiorite of Triassic age (Tempelman-Kluit, 1974b). The main mineralized zone is relatively flat-lying, 50 to 200 feet (15 to 60 m) thick and 200 to 400 feet (60 to 120 m) below surface. It is approximately elliptical in plan, measuring 1,200 feet (240 m) east-west. The mineralized zone generally tends to pinch out and interfinger with massive and porphyritic granodiorite except to the north where it is truncated by a fault striking 100° and dipping 60° to the north.

The primary ore minerals are chalcopyrite and bornite which occur as small veinlets and disseminated grains and irregular blebs interstitial to and replacing gangue minerals, particularly biotite. Pyrite is not abundant and occurs mainly on the fringes of the main mineralized zone. Magnetite is associated with chalcopyrite and bornite in varying amounts.

Current Work and Results:

In 1976 a feasibility study was carried out on the combined MINTO and DEF properties. The study determined reserves on the combined property to be 7,221,000 short tons grading 1.86 per cent copper, 0.20 ounces per ton silver and 0.015 ounces per ton gold but concluded that production would be uneconomic under current economic conditions (F.A. Godfrey, remarks to 30th Annual Meeting of United Keno Hill Mines Limited).

SAM	Copper, Gold
Anglo American Corporation	115 J 9
of Canada Exploration, Limited	(62°39'N, 138°05'W)

References: Bostock (1944); Tempelman-Kluit (1974b); Sinclair *et al* (1975, pp. 95-96).

Claims: SAM 1-98

Location and Access:

The claims are situated in the Dawson Range 65 miles (105 km) northwest of Carmacks. They are bordered by Hayes Creek to the north and east and by Butterworth Gulch to the south. Elevations on the property range from 2,000 to 3,500 feet. Access to the property is normally by helicopter.

History:

Placer gold was discovered in Klines Gulch as early as 1898 and placer mining has been carried out intermittently since then. Quartz veins were discovered around Klines Gulch in 1899 and an 80-foot adit was driven in the early 1900's. The area was staked as the HAYES claims in 1965 by Coranex Limited and subsequently as the DP claims in 1969 by Dawson Range Joint Venture and the NADA claims by D.C. Syndicate in 1974. Anglo American Corporation of Canada Exploration, Limited staked the SAM claims in October 1975.

Description:

The property is underlain primarily by metamorphic rocks of the Yukon Group which are intruded to the southwest by Triassic granodiorite of the Klotassin Batholith (Tempelman-Kluit, 1974b). Trace amounts of chalcopyrite and molybdenite are associated with disseminated pyrite and pyrrhotite in a small quartz monzonite stock intruding Yukon Group rocks. Traces of chalcopyrite and molybdenite also occur with disseminated pyrite in the bleached, quartz-veined contact zone within the Yukon Group rocks.

Current Work and Results:

During 1976, Anglo American carried out a geochemical soil survey on the property.

PATT — Copper, Molybdenum
Amoco Canada Petroleum Company Limited — 115 J 10
(62°32'N, 138°38'W)

References: Tempelman-Kluit (1974b); Sinclair *et al* (1975, p. 94; 1976, pp. 146-147).

Claims: PATT 1-48

Location and Access:

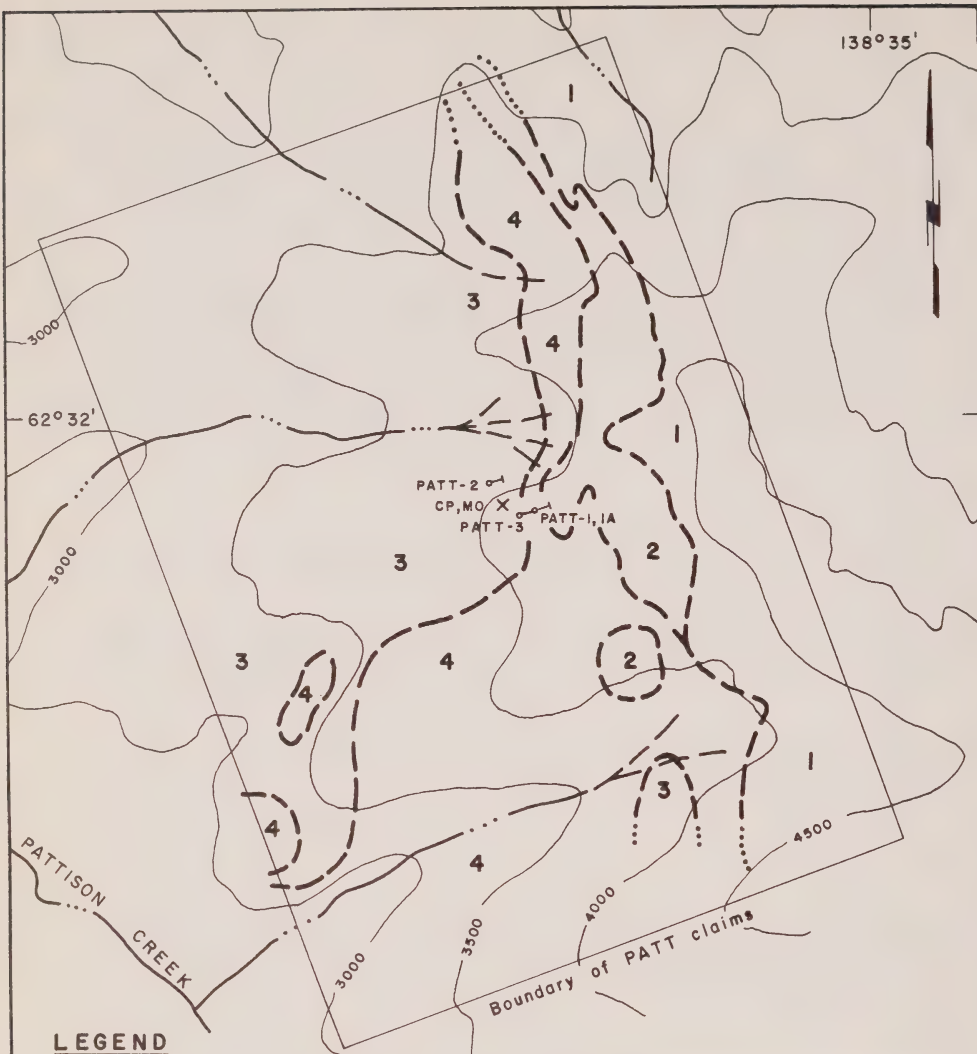
The claims are roughly four miles (6.5 km) north of Mount Pattison, near the headwaters of Pattison Creek. Elevations on the property range from 3,000 to over 4,500 feet. Access in 1976 was by helicopter from Carmacks, 80 miles (130 km) to the east-southeast.

History:

The claims were staked in 1974 at which time geological mapping and soil sampling were carried out. An induced polarization survey was performed in 1975 and several areas of anomalous chargeability were outlined.

Description:

The eastern part of the property is underlain by Nasina Quartzite of the Yukon Metamorphic Complex (Tempelman-Kluit, 1974b). The Nasina quartzite is generally a dark, graphitic and micaceous quartzite with interfoliated graphitic biotite-muscovite schist. To the west, the Nasina Quartzite is intruded by biotite hornblende granodiorite to quartz diorite of the Triassic (?) Klotassin Batholith. This rock is medium- to coarse-grained and equigranular. Biotite and hornblende typically comprise 10-15 per cent of the rock. The granodiorite is intruded by quartz monzonite and alaskite. The quartz monzonite consists of quartz and feldspar phenocrysts in a grey, fine- to medium-grained quartzo-feldspathic groundmass. The alaskite is a leucocratic,



LEGEND

4 Alaskite

3 Quartz Monzonite

2 Granodiorite

1 Yukon Group Metasediments

Geological Boundary (approximate, assumed)

X Mineral occurrence

CP Chalcopyrite

MO Molybdenite

Diamond Drill Hole

4000 Contours (in feet)

GEOLOGY OF THE PATT CLAIMS, WHITEHORSE MINING DISTRICT

4

(Based on Company plans)

medium-grained, equigranular rock characterized by argillic alteration of the feldspars. The quartz monzonite and alaskite are probably both related to the Eocene feldspar porphyry unit described by Tempelman-Kluit (1974b).

Minor amounts of chalcopyrite and molybdenite occur in narrow quartz veins cutting quartz monzonite rubble near the centre of the property.

Current Work and Results:

Four holes totalling 1,853 feet (560 m) were drilled in 1976. The drilling encountered mainly quartz monzonite and alaskite. Minor amounts of chalcopyrite and molybdenite were encountered in quartz veins up to 1 cm across cutting quartz monzonite and traces of disseminated molybdenite were found in altered alaskite. The results of the drilling are summarized as follows:

Hole No.	Dip	Length of Intersection (feet)	Cu (%)	MoS_2 (%)
PATT-1	-90°	173	0.01	0.059
PATT-1A	-45°E	540	0.01	0.015
PATT-2	-45°E	545	0.01	0.004
PATT-3	-45°E	528	0.01	0.037

DOYLE
Amoco Canada Petroleum Company Limited

Copper, Molybdenum
115 J 11
(62°39'N, 139°13'W)

References: Tempelman-Kluit (1974b); Sinclair et al (1975, pp. 93-94; 1976, p. 147).

Claims: DOYLE 1-40

Location and Access:

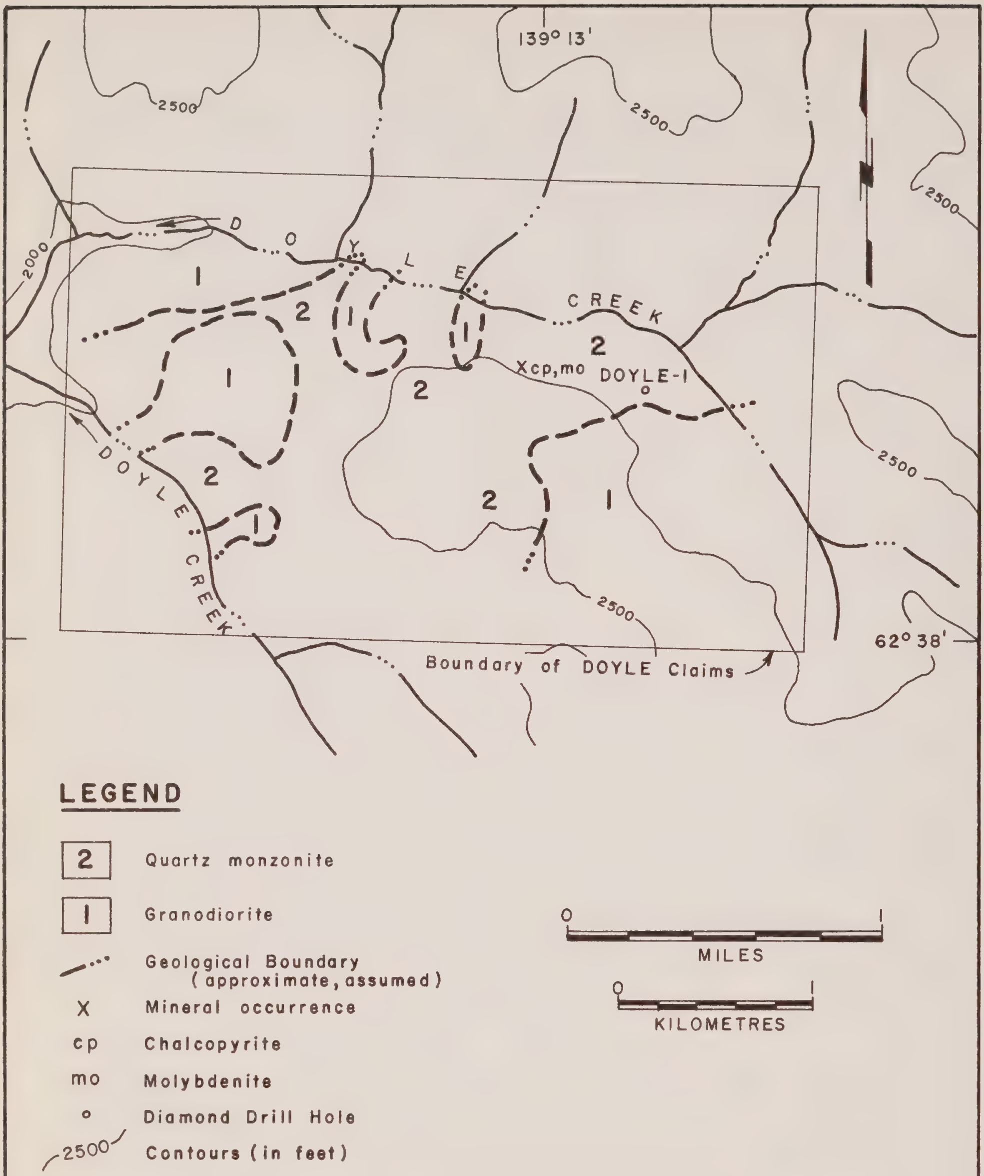
The claims are situated near the headwaters of Doyle Creek, 12 miles (19 km) southwest of the Casino copper-molybdenum property. Elevations on the property range from 2,000 to slightly more than 2,500 feet. Access in 1976 was by helicopter.

History:

The claims were staked in 1974 following a regional geochemical and geological reconnaissance program. Detailed geological mapping and soil sampling were carried out in 1974 and an induced polarization survey was conducted in 1975.

Description:

Outcrop is not well exposed on the property and the distribution of rock types has been determined mainly from rubble. The property is underlain mainly by biotite hornblende granodiorite of the Triassic (?) Klotassin Batholith (Templeman-Kluit, 1974b). The granodiorite is intruded by quartz monzonite which may be related to the feldspar porphyry of Eocene age described by Tempelman-Kluit (1974b). Minor amounts of disseminated pyrite, molybdenite and chalcopyrite and molybdenite in quartz veins were found in locally altered quartz monzonite.



GEOLOGY OF THE DOYLE CLAIMS,
WHITEHORSE MINING DISTRICT

(Based on Company plans)

5

Current Work and Results:

One diamond drill hole of 501 feet (150 m) was drilled in 1976 to test a subtle induced polarization anomaly coincident with a molybdenum geochemical anomaly. The hole encountered altered quartz monzonite and granodiorite with trace amounts of chalcopyrite and molybdenite which assayed 0.01 per cent Cu and 0.002 per cent MoS_2 over 460 feet.

CC
Amoco Canada Petroleum Company Limited

Copper, Molybdenum
115 J 11
(62°41'N, 139°09'W)

References: Tempelman-Kluit (1974b); Sinclair et al (1975, p. 93; 1976, pp. 147-148).

Claims: CC 1-36

Location and Access:

The claims are situated near the headwaters of a tributary of Coffee Creek, 10 miles (16 km) southwest of the Casino copper-molybdenum property. Elevations range from 2,600 to 4,000 feet. Access in 1976 was by helicopter.

History:

The claims were staked in 1974 following a regional geochemical survey. Geological mapping and detailed soil sampling were carried out in 1974 and an induced polarization survey was conducted in 1975.

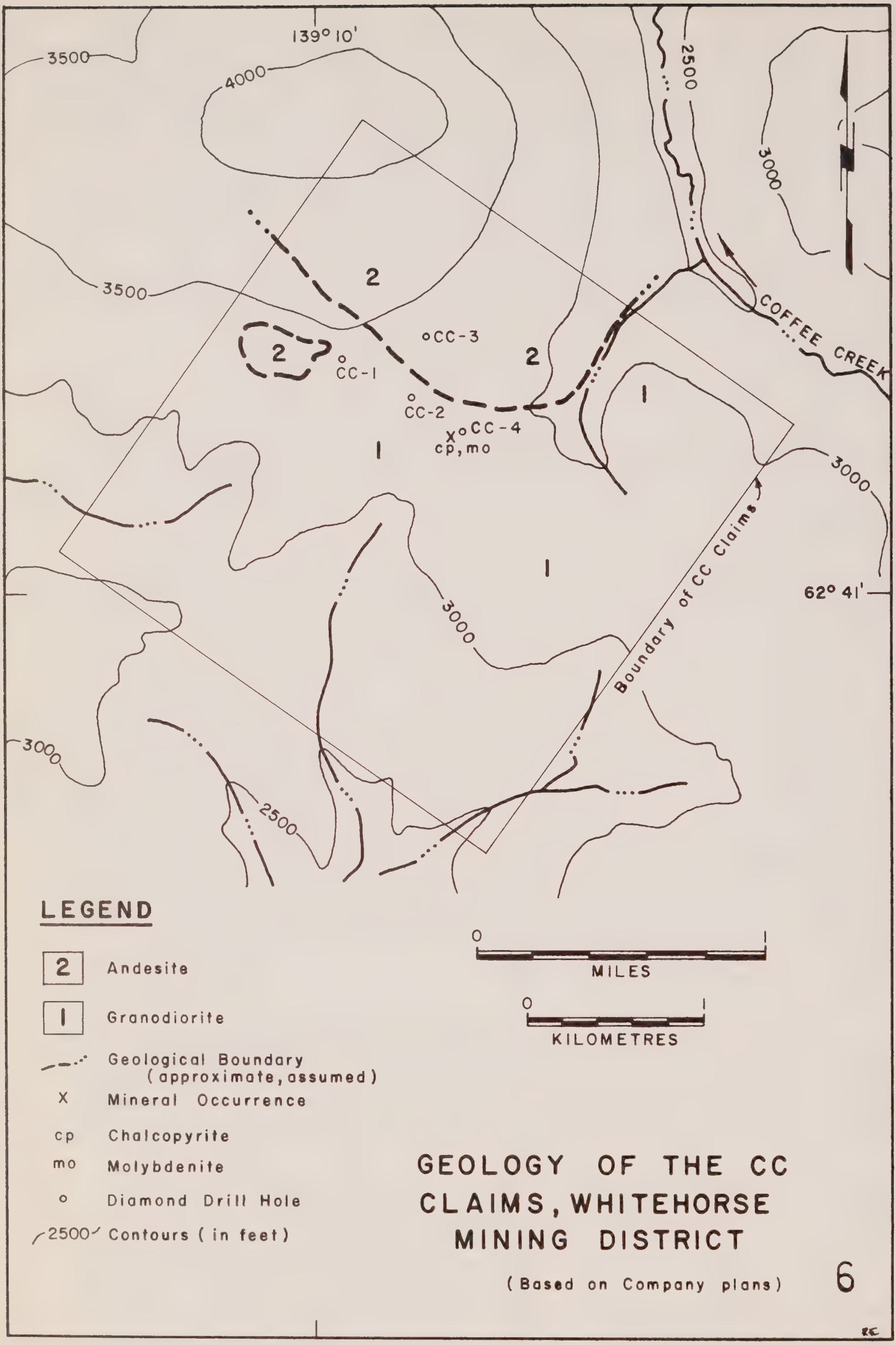
Description:

Although there is virtually no outcrop within the area of the CC claims, the distribution of rock types has been determined by Amoco geologists from float and rock chips in the residual soils of the area. The property is underlain mainly by biotite hornblende granodiorite of the Klotassin Batholith of Triassic (?) age (Tempelman-Kluit, 1974b). The granodiorite is medium- to coarse-grained and equigranular. It typically contains 10-15 per cent biotite and hornblende and 25 per cent quartz. To the north, the granodiorite is overlain by fine-grained, dark green andesite which Tempelman-Kluit (1974b) correlates with the Casino volcanics of Eocene age. Minor amounts of disseminated chalcopyrite and molybdenite in granodiorite occur in float near the centre of the property.

Current Work and Results:

Four holes totalling 1,961 feet (600 m) were drilled on the CC claims in 1976. The holes intersected mainly granodiorite carrying trace amounts of chalcopyrite and molybdenite in quartz veinlets and locally disseminated. Hole CC-3, collared in andesite, encountered 108 feet of andesite rubble before intersecting granodiorite cut by alaskite dykes. The results of the drilling are summarized as follows:

Hole No.	Dip	Length of Intersection (feet)	Cu (%)	MoS_2 (%)
CC-1	-90°	488	0.02	0.004
CC-2	-90°	507	0.02	0.005
CC-3	-90°	328	0.01	0.001
CC-4	-90°	449	0.01	0.002


139° 10'
3500
4000
2500
3000
2
CC-3
CC-1
CC-2
CC-4
X
cp, mo
1
COFFEE CREEK
3000
62° 41'
Boundary of CC Claims
3000
2500
LEGEND
2 Andesite
1 Granodiorite
Geological Boundary (approximate, assumed)
X Mineral Occurrence
cp Chalcopyrite
mo Molybdenite
o Diamond Drill Hole
2500 Contours (in feet)
0 1 MILES
0 1 KILOMETRES
GEOLOGY OF THE CC CLAIMS, WHITEHORSE MINING DISTRICT
(Based on Company plans)
6

HUE 115 N 2
Sproatt Silver Mines Limited (63°05'N, 140°55'W)

Reference: Tempelman-Kluit (1974a); Sinclair *et al* (1976, p. 152).

Claims: HUE 1-18

Location and Access:

The claims are situated in the Moosehorn Range, 93 km north of Beaver Creek and about 128 km southwest of Dawson. Access is provided by helicopter from Beaver Creek to the property.

History:

The claims were staked in January 1974 and abut on to the northwest border of the LORI group of Claymore Resources.

Description:

The property is underlain by foliated hornblende biotite granodiorite of the Klotassin Batholith.

Current Work and Results:

During summer 1975, a geochemical soil survey was conducted for Pb, Ag, Au. Soil samples were collected at 200 foot intervals along northeast trending lines spaced 400 feet apart. No significant geochemical anomalies were determined, though a minor gold anomaly was located in the southern portion of the claim group. No work was performed in 1976 and the claims were returned to A. Harman.

WATSON LAKE MINING DISTRICT

McMillan Property
Noranda Exploration Company Limited

Lead, Zinc, Silver
95 D 12
(60°31'N, 127°56'W)

References: Gabrielse and Blusson (1969); Sinclair *et al* (1976).

Claims: STRAT 1-79, 81-96; QTZ 1-8

Location and Access:

The property is located 64 km northeast of Watson Lake and immediately south and west of Quartz Lake. Access is by means of helicopter or float plane from Watson Lake.

History:

The McMillan showing was known to prospectors as early as 1892 and has been worked on by several interests. In 1975, Noranda Exploration undertook exploration on the property and staked the STRAT group. Their program consisted of detailed rock and soil geochemical surveys, electromagnetic and gravity surveys and 27 diamond drill holes totalling 8,400 feet (Sinclair *et al*, 1976).

Description:

The property is underlain by Hadrynian sedimentary rocks consisting of maroon and green argillite with intercalated quartzite and limestone (Unit 1, Gabrielse and Blusson, 1969). They have a general northwest trend and dip gently to the northeast and are cut by a number of steeply-dipping, north-trending faults and by thrust faults dipping gently to the east.

The McMillan deposit is a zone of massive sulphides up to 15 metres thick that is generally conformable with the enclosing calcareous argillite and limestone host rocks. Mineralization consists mainly of pyrite with galena, sphalerite and minor arsenopyrite, boulangerite, tetrahedrite and chalcopyrite. A more detailed description is available in the 1975 M.I.R. (Sinclair *et al*, 1976).

Current Work and Results:

During summer 1976, geochemical soil sampling, CEM, VLF and gravity survey programs were conducted over a large portion of the claim group. Soil samples were collected at 200 foot intervals along lines 800-900 feet apart and were analyzed for copper, lead, zinc, cadmium and molybdenum. Sporadic local anomalies were determined, especially in swampy areas. Only a few weakly positive anomalies were determined by the gravity survey. The CEM survey indicated a conductor extending north of the known mineralized zone and further work consisting of diamond drilling the north extension was recommended.

BAR
D.C. Syndicate

Barite, Lead
105 C 8, 9
(60°30'N, 132°14'W)

Reference: Mulligan (1963).

Claims: BAR 1-20

Location and Access:

The property is located east of Wolf River, 45 km northwest of Teslin. Access to the property is by helicopter from Teslin or by a 56 km winter road from Hays Creek at Km 1272 on the Alaska Highway.

History:

The BAR 1-8 claims were recorded in June 1976 and BAR 9-20 in September 1976. Portions of the property had been staked in the past as the following claim groups: SMEG (1971), KEY (1969), SUPERIOR (1957) and as RED TOP and AMBER SPRING (1956).

Description:

The property is underlain by northerly trending clastic and carbonate rocks of probable Devono-Mississippian age (Units 2, 3, of Mulligan, 1963). A barite horizon is situated between a unit of grey chert pebble conglomerate and a unit of grey green chert. It is made up of massive to disseminated white barite with a considerable amount of associated white quartz. Major amounts of pyrite as fine disseminations, streaks and small lenses and very minor fine-grained galena as fracture fillings are reported to occur within the barite horizon. Mineralized float consisting of poorly banded massive pyrite in grey green chert was also found on the property. Several spring produced limonite deposits also occur. They are associated with ground seeps and consist of gravel, talus and organic matter enclosed in limonite.

Current Work and Results:

During summer 1976, detailed geological mapping (1 inch = 200 feet), geochemical soil sampling and induced polarization survey programs were conducted on the property. A total of 553 soil samples were collected at 200 foot intervals along grid lines spaced 200 or 400 feet apart and analyzed for Cu, Pb, Zn, Ag. In general, lead and silver anomalies coincided with the barite horizon. No copper anomalies were determined and the zinc anomalies were attributed to secondary hydromorphic concentrations.

A series of pits were dug on several of the sinter deposits and sampled at narrow intervals. Several isolated anomalously high values in zinc and lead were determined, which suggest that some of the sources for the sinters may be lead, zinc and silver rich. Several induced polarization anomalies were determined over the known barite-pyrite mineralization and also over possible extensions of the mineralized zone. Further work consisting of detailed geological mapping, geochemical soil sampling and a ground magnetometer survey was recommended by a consulting geophysicist.

WEASEL
Archer-Cathro and Associates Limited

Molybdenum, Uranium
105 F 1
(61°11'N, 132°25'W)

References: Wheeler et al (1960); Tempelman-Kluit (1977).

Claims: WEASEL 1-16

Location and Access:

The claims are located about 153 km northeast of Whitehorse and 225 km northwest of Watson Lake. Access is by helicopter from the Canol Road, 40 km to the west or from Moss Lake, 10 km to the northeast.

History:

The claims were staked in June 1975 to cover a molybdenum showing previously owned by Conwest Exploration Limited (MOLLY claims). During 1963, Conwest carried out an extensive surface sampling program of geological mapping, trenching and diamond drilling (15 holes totalling 1,482 feet).

Description:

The property is underlain by Middle Devonian limestone and limy argillite which are locally altered to skarn and rusty hornfels near the contact with porphyritic granodiorite of the Cretaceous Weasel Batholith. The main zone is made up of a mineralized skarn which consists of erratic patches of coarse-grained molybdenite accompanied by pyrrhotite, lesser amounts of chalcopyrite and purple fluorite, traces of scheelite and an unidentified uranium mineral. An additional zone on the property (Saddle or North Zone) consists of disseminated molybdenite in a siliceous zone developed within hybrid granite along the intrusive contact.

Current Work and Results:

During summer 1975, the property was subjected to detailed radiometric prospecting and random silt sampling for Cu, Mo, U and W. No specific zone of strong radioactivity was located although a substantial range was present in the rock types exposed.

NOKLUIT
Archer, Cathro and Associates Limited

Rare Earths
105 F 8
(61°29'N, 132°11'W)

Reference: Wheeler et al (1960).

Claims: NOKLUIT 1-8

Location and Access:

The claims are located immediately south of the headwaters of the Ketza River, 58 km south of Ross River. Access is provided by helicopter from Ross River or Whitehorse (176 km to the southwest) or from the South Canol Road. In addition, a tote road follows the Ketza River valley to within 6.5 km of the property.

History:

The claims NOKLUIT 1-8 were recorded in August 1976. They were staked by Ukon Joint Venture managed by Archer, Cathro and Associates Limited, following the investigation of some radioactive anomalies determined during a reconnaissance airborne radiometric survey.

Description:

The property is underlain by Cambrian carbonates, volcanic, volcaniclastic and clastic rocks of Mississippian age. Mineralization consists of radioactive rare-earth enriched zones associated with purple fluorite, siliceous veining and a chert-quartzite unit.

Current Work and Results:

During summer 1976, the area was geologically mapped (1 inch = 400 feet), prospected and subjected to airborne and limited ground radiometric surveys. Only a few regional geochemical samples (silt and water) were taken and none of these returned anomalous values in uranium. Recommended further work consists of detailed geological mapping and geochemical sampling programs.

KET — Lead, Zinc
Noranda Exploration Company Limited — 105 F 8, 9
(61°30'N, 132°08'W)

Reference: Wheeler *et al* (1960a).

Claims: KET 1-24

Location and Access:

The property is located 58 km south of Ross River at the headwaters of the Ketza River. Access is provided by helicopter from Ross River.

History:

The claims were recorded in August 1976.

Description:

The property is underlain by Cambro-Ordovician phyllite. Mineralization consists of galena and sphalerite in quartz-carbonate veins and breccias.

Current Work and Results:

During summer 1976, the property was subjected to geological mapping (1 inch = 400 feet) and geochemical soil sampling programs. Weak, vaguely coincident Pb-Zn soil anomalies were obtained and prospecting, geology and a minor VLF-EM survey returned discouraging results.

GUANO, GUAYES
Archer, Cathro and Associates Limited

Uranium, Rare Earths
105 F 8, 9
(61°30'N, 132°25'W)

Reference: Wheeler et al (1960).

Claims: GUANO 1-22; GUAYES 23-30

Location and Access:

The property is located 58 km south of Ross River and 5 km east of McConnell River. Access is provided by helicopter from Whitehorse (171 km to the southwest), Ross River or camps on the South Canol Road. A tote road along Groundhog and Seagull Creeks extends from the South Canol Road to Grayling Lake, 10 km west of the property.

History:

The radioactive showings were found by Ukon Joint Venture managed by Archer, Cathro and Associates Limited.

Claims GUANO 1-14 were recorded in July 1976, GUANO 15-18 in August and 19-22 in September 1976. A further eight claims, GUAYES 23-30 were recorded in September 1976. The claims were initially staked following the discovery of radioactive skarn found by a ground prospecting follow-up on an airborne radiometric anomaly.

Description:

The property is underlain by a hypabyssal syenite stock of Mississippian (?) age (Wheeler et al 1960) that is intrusive into a Lower Paleozoic sequence of carbonates and clastic rocks overlain by Mississippian felsic volcaniclastic rocks and black slate. Radioactive skarn occurs in several places where the syenite is in contact with carbonate rocks. The skarn consists of serpentine, actinolite, tremolite, idocrase, magnetite and radioactive and rare earth minerals.

Current Work and Results:

During the 1976 field season, preliminary geological mapping, prospecting and preliminary geochemical soil, silt, water, rock chip and whole rock sampling was undertaken. About 200 geochemical samples were collected and several scattered anomalies were determined. Further work was recommended to consist of detailed geological mapping, a grid radiometric survey and geochemical soil and rock sampling.

CHZERPNOUGH
Cyprus Anvil Mining Corporation Limited

Lead, Zinc, Barite
105 F 9
(61°36'N, 132°26'W)

Reference: Wheeler et al (1960).

Claims: CHZERPNOUGH 1-16

Location and Access:

The property is located at the head of Cloutier Creek, immediately south of Peak 7001. Access is by helicopter from Ross River 48 km to the north.

History:

Claims CHZERPNOUGH 1-16 were recorded in August 1976. The claim group covers showings which were discovered during a regional prospecting program carried out by the Pelly Project, a joint venture exploration program undertaken during 1976 by Cyprus Anvil Mining Corporation and Hudson Bay Oil and Gas.

Description:

The property is underlain by felsic volcaniclastic rocks of Mississippian age. A lapilli tuff with abundant carbonate in the matrix is the most common rock unit and the one which hosts the mineralized showings. Mineralization consists of talus occurrences of a sugary textured barite unit with disseminated sphalerite, galena and fluorite.

Current Work and Results:

During summer 1976, geochemical soil sampling and detailed prospecting were carried out. Soil samples (318) were collected at 200 foot intervals along grid lines spaced 400 feet apart and analyzed for Cu, Pb, Zn. A large area of anomalous Pb-Zn response was determined which partially coincided with the known showings. Further work was recommended by a company geologist to consist of detailed geological mapping, hand trenching, magnetic and electromagnetic surveys.

MAT	Lead, Silver, Gold, Zinc
Welcome North Mines Limited	105 F 10
M. Sherman	(61°32'N, 132°35'W)

Reference: Wheeler et al (1960).

Claims: MAT 1-16, 18-24

Location and Access:

The property is located on the east side of Seagull Creek about 40 km south of Ross River and 26 km east of the Canol Road. Access to the property is by helicopter from Ross River.

History:

MAT claims 1-4 were recorded in August, 1974 and MAT 5-16, 18-24 in September, 1975. The ground was first staked in 1963 by Conwest Exploration and since then it has been dropped and restaked several times, the exploration work mainly consisting of geological mapping and trenching.

Description:

The area is underlain by volcanic, volcaniclastic and associated sedimentary rocks of Mississippian to Permian age that are intruded by hypabyssal plugs of syenite. The volcanic sequence is underlain by 500 metres of Devono-Mississippian black siliceous slate and minor wacke and is overlain by several hundred metres of laminated strongly bioturbated shale and siltstone which are in turn overlain by 500 metres of Middle to Upper Triassic silty sandy medium grey, thin-bedded limestone.

The main showing occurs within a sequence of graphitic slate and foliated quartz-eye tuff and consists of a 1.5 metre section of massive galena exposed on the bottom of a north-northwesterly flowing creek (MAT # 3). Surrounding the galena is a zone of pyrite which occurs as fine grained disseminations and as semi-massive lenses. In addition, scattered veinlets of medium to coarse-grained galena occur within an area about 23 m long along the creek walls.

The following table presents assayed grab samples from the main showing area.

Description	Zn wt%	Pb wt%	Au oz/ton	Ag oz/ton
Massive banded pyrite with some botryoidal texture and flow structure	0.05	2.06	0.07	11.12
Massive bedded coarse grained pyrite	0.02	1.72	0.03	6.54
Botryoidal (?) pyrite with galena matrix	0.25	21.0	0.03	46.22
Massive fine grained pyrite	0.05	0.68	0.09	1.25
Massive coarse grained pyrite	0.03	0.25	0.04	0.24

About 120 m west of the main showing, a parallel gossan zone occurs which can be traced intermittently over a strike length of 360 metres The gossan consists of green to greenish grey felsic volcanics with very minor pyrite and pyrrhotite.

Current Work and Results:

In 1976, preliminary geological and geochemical soil sampling programs were conducted in the area of the main showing. Soil samples were analyzed for Cu, Pb, Zn and collected along lines spaced 400 feet apart at intervals of 200 feet for a total line length of 11,000 feet. Several anomalies were determined, one of which was considered to reflect an extension of the sulphide mineralization in the main showing area. Further work was recommended to consist of detailed geological mapping, geochemical soil sampling and bulldozer trenching.

BNOB
Cyprus Anvil Mining Corporation

Lead, Barite
105 F 10
(61°35'N, 132°30'W)

Reference: Wheeler *et al* (1960).

Claims: BNOB 1-24

Location and Access:

The property is located in the valley of the McConnell River, 48 km south of Ross River. Access is provided by helicopter from Ross River.

History:

Claims BNOB 1-16 were recorded in July 1976 and BNOB 17-24 in September 1976. The claim group was staked as a result of a regional prospecting program carried out by the Pelly Project, a joint venture exploration program carried out by Cyprus Anvil Mining Corporation and Hudson Bay Oil and Gas.

Description:

The property is underlain by Mississippian volcanic and volcaniclastic rocks of felsic composition. A 9 m thick bed of sugary white barite outcrops for a length of 45 m and is traceable in talus float for an additional 300 metres. The geology appears to be structurally complex with probably at least two phases of folding. Trace amounts of galena occur within the barite bed and high concentrations of pyrite occur within the associated felsic volcanic breccias.

Current Work and Results:

During 1976, geochemical soil sampling and detailed prospecting were carried out. Soil samples (216) were collected at 200 foot intervals along lines spaced 400 feet apart and analyzed for Cu, Pb, Zn. A 900 metre Pb-Zn anomaly was determined which conformed to the arcuate outcrop pattern of the barite unit. Further work consisting of geological mapping, magnetic and electromagnetic surveys were recommended by a company geologist.

SUN, DM — 105 F 10
Welcome North Mines — (61°35'N, 132°40'W)

References: Wheeler *et al* (1960).

Claims: SUN 1-16; DM 1-12

Location and Access:

The property is located 45 km south of Ross River and 23 km east of the Canol Road. Access to the property is by helicopter from Ross River or by four wheel drive vehicle from the Canol Road via the Groundhog Creek tote trail to Seagull Creek.

History:

The claims were recorded in October, 1975.

Description:

The property is underlain by Mississippian volcanic and associated volcaniclastic and sedimentary rocks (Units 6a, c of Wheeler *et al*, 1960). Locally, the lithology consists of two main types: greyish-green quartz-chlorite-sericite phyllite with minor interbedded porphyritic andesite and grey sericite phyllite. A pyritic facies of the sericite phyllite, wavy-banded limestone and argillite with minor interbedded quartz pebble conglomerate appear to be in fault contact with quartz sericite phyllite at the northeast end of the DM claims.

Current Work and Results:

During September, 1976, a geochemical soil sampling program for Cu, Pb, Zn was conducted over a portion of the property. Samples were collected at 200 foot intervals along grid lines spaced 1,000 feet apart for a total line length of about 44,000 feet. The survey resulted in the delineation of three anomalous zones and further work was recommended to consist of more detailed geochemical soil sampling and detailed magnetic and electromagnetic surveys over the anomalous zones.

PASS PEAK — Zinc
Noranda Exploration Company Limited — 105 F 10
(61°37'N, 132°48'W)

Reference: Wheeler *et al* (1960).

Claims: PEAK 1-8

Location and Access:

The claims are situated 6.5 km north of Pass Peak at elevations ranging from 5,000 to 6,000 feet. Access in 1976 was by helicopter from Ross River, 45 km to the north-northeast, or from the Canol Road, 18 km to the west.

History:

The claims were staked in August 1976 following a reconnaissance geochemical survey in the area.

Description:

The property is underlain by phyllite of Cambrian age (Unit 2, Wheeler *et al*, 1960) which is overlain by Devonian dolomite (Unit 4, op. cit.). Minor amounts of sphalerite are reported to occur in the Devonian dolomite.

Current Work and Results:

In 1976 Noranda carried out reconnaissance geological mapping on the property in addition to soil and silt sampling and an EM survey. The soil sampling outlined minor zinc anomalies which appear to company geologists to reflect minor sphalerite mineralization in the Devonian dolomite. The EM results appear to reflect bedrock lithology.

ANISE — 105 F 10
Cyprus Anvil Mining Corporation Limited — (61°40'N, 132°45'W)

Reference: Wheeler *et al* (1960).

Claims: ANISE 1-64

Location and Access:

The property is located in Seagull Creek Valley immediately south of Seagull Lakes. Access is provided by helicopter or float plane from Ross River, 48 km to the north. A tote road passable by 4 wheel-drive vehicles passes through the claim group and connects it with the South Canol Road at Groundhog Creek, 19 km to the west.

History:

ANISE claims 1-48 were recorded in July 1976 and 49-64 in August 1976. The claims were staked to cover geochemical anomalies and float occurrences of galena, sphalerite and pyrrhotite found as a result of a regional prospecting program by the Pelly Project, a joint venture exploration program carried out by Cyprus Anvil Mining Corporation and Hudson Bay Oil and Gas.

Description:

The property lies in an overburden covered valley bottom area and little bedrock is exposed. Those rocks which do outcrop are black, pyritic shale and schistose greyish-green volcanics of intermediate composition and probable Mississippian age. The linear nature of the valley suggests that it marks the site of a NW-SE trending fault, the "Seagull Fault". West of Seagull Valley, shale and limestone of the Kechika Formation of Cambrian to Ordovician age occur whereas east of the Valley, Mississippian volcanic rocks of intermediate compositon occur.

Current Work and Results:

During summer 1976, geochemical soil sampling and prospecting programs were carried out. Soil samples (626) were collected at 200 foot intervals along grid lines spaced 800 feet apart and analyzed for Cu, Pb and Zn. The soil sampling determined numerous isolated and erratic anomalies, but no well defined anomalous zones. Further work consisting of magnetic and electromagnetic surveys was recommended by a company geologist.

SU, HIGH, WAY, CALGAL — 105 F 16
Welcome North Mines Limited — (61°51'N, 132°12'W)
Silver Standard Mines Limited

References: Wheeler *et al* (1960); Tempelman-Kluit (1977).

Claims: HIGH 1-10; WAY 1-10; SU 1-38; CALGAL 1-16

Location and Access:

The property is located north of the Robert Campbell Highway and Bruce Lake. Access is by road from Ross River, 40 km to the north.

History:

The CALGAL, HIGH and WAY claims were staked in August 1975 for Welcome North and Mackir Mines Limited and the SU claims were staked by Silver Standard Mines Limited in September 1974. In November 1975, an agreement was entered into such that Welcome North, Mackir Mines and Malabar Silver Mines could acquire interest in the SU claims by completion of certain work commitments.

Description:

The claims are underlain by Precambrian phyllitic rocks which are locally altered to sericite and limonite.

Current Work and Results:

In summer 1975, a gravity anomaly was determined on the Welcome North-Mackir CALGAL property adjacent to the SU No. 7 mineral claim. The anomaly was tested by a 548 foot diamond drill hole in November and December, 1975 on the SU No. 7 claim, but no mineralization was encountered.

BOW
Hudson Bay Exploration and
Development Company Limited

105 G 3
(61°00'N, 131°25'W)

Reference: Wheeler et al (1960b).

Claims: BOW 1-48, 49-66, 67-70, 71-79, 80-109, 110-118, 119-128, 129-143, 144-175, 176-281, 282-288

Location and Access:

The property consists of eleven different claim groups situated near the north end of the Liard River Valley, about 130 km southeast of Ross River. Access is provided by helicopter from Ross River or by fixed-wing aircraft to the Tintina Silver airstrip (115 km southeast of Ross River) and then by helicopter to the property.

History:

The claims were recorded in December 1975.

Description:

The property is covered by overburden, but the few outcrop exposures present indicate the area is underlain by siltstone and dolomite (Unit 4 and 5, Wheeler et al, 1960b) of probable Silurian age with minor limestone and shale. In the eastern section of the area, phyllite and limestone (Units 1 and 2, Wheeler et al, 1960b) underlie the Silurian rocks.

Current Work and Results:

During 1975, an airborne EM survey was carried out over the area of the claim groups. Follow-up ground EM and minor magnetic surveys, geological mapping (1 inch = 400 feet) and minor geochemical soil sampling were carried out on most of the claim blocks in 1976.

EAGLE
Tintina Silver Mines Limited

Silver, Lead, Zinc
105 G 3
(61°08'N, 131°10'W)

References: Wheeler *et al* (1960); Skinner (1962, pp. 37-39); Green and Godwin (1963, pp. 26-29); Sinclair *et al* (1975, pp. 156-158; 1976, pp. 164-165).

Claims: EAGLE 1-58, 66, 73, 74, 77, 78, 81-85, 115-138

Location and Access:

The EAGLE claim group is situated in southern St. Cyr Mountains, 7 km west of the Ings River and 112 km south-southeast of Ross River. The terrain in the area of the property is rugged and the main showings occur in a north-trending cirque-valley at elevations of over 1,500 metres. Access to the property in 1976 was by fixed wing from Ross River to an airstrip 8 km south-west of the property and then by helicopter to the property itself, or by helicopter directly from Ross River. A 171 km winter road to the property from Mile 790 (Km 1272) on the Alaska Highway was constructed in 1961.

History:

The EAGLE claims along with the RAM, EL and IT groups were originally staked in 1961 by Conwest Exploration Company Limited following the discovery of silver-lead-zinc showings by Nels Hals, a prospector working for Conwest. During August and September 1961, Conwest trenched, packsack drilled and sampled eight of nine showings discovered in the cirque area and discovered and prospected six other showings to the northwest. In December 1961, the property was acquired by Tintina Silver Mines Limited.

In February 1962, an adit was collared at about the 5,375 foot level and roughly 1,830 feet of underground development and 3,201 feet of underground diamond drilling in 22 holes were carried out. Additional work in 1962 included 625 feet of surface drilling in six holes, an electromagnetic survey and detailed geological mapping. Results of the 1962 work proved disappointing and no further work was undertaken until 1968, when a geochemical survey was carried out on the property. The property was dormant until 1974 when almost 12,000 feet of diamond drilling was carried out. The following are some of the more favourable intersections:

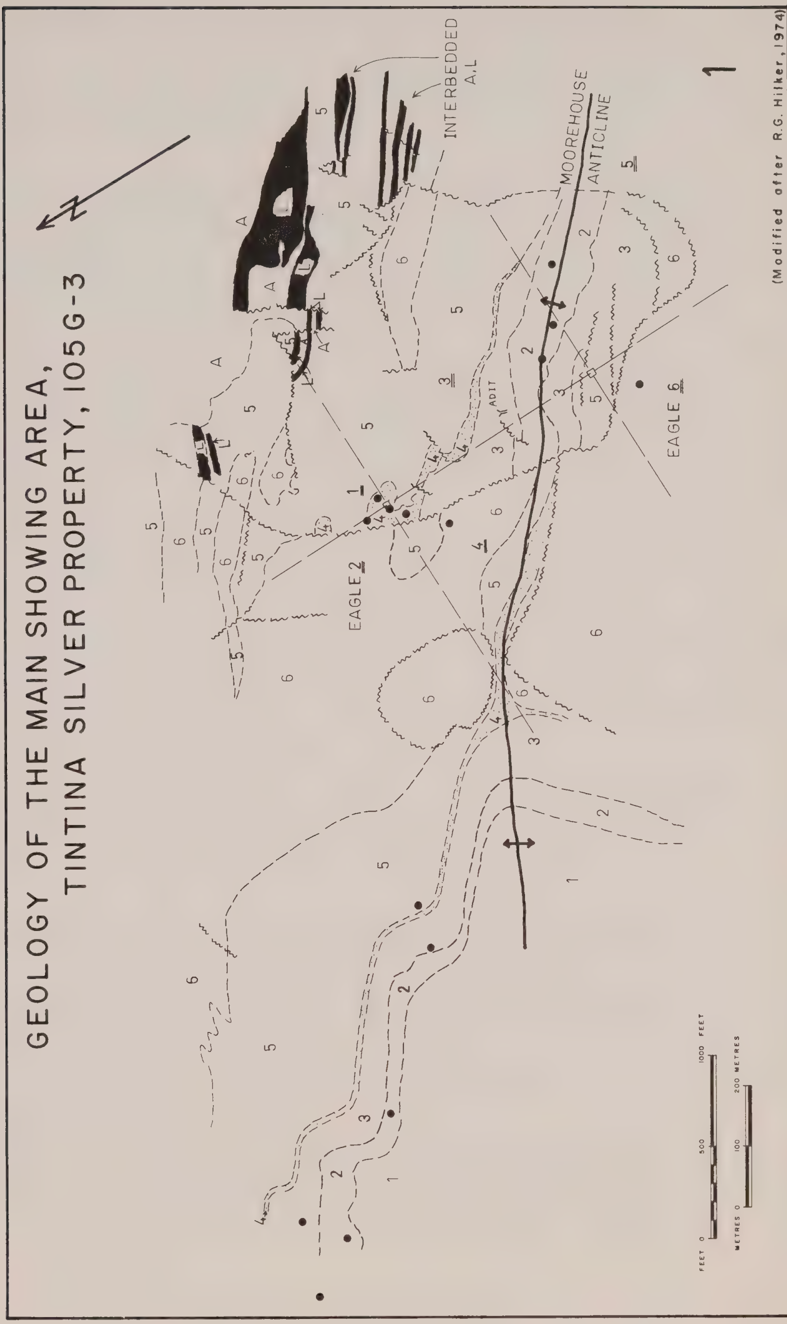
Drill Hole	Interval	Ag oz/ton	Pb (wt%)	(Zn (wt%)
A-8	25-40 ft	79.27	0.83	6.20
A-41	13.6-25.3 ft	127.28	11.44	19.60
A-41	58.7-65.7 ft	6.77	1.76	8.46

However results of the 1974 work were inconclusive and in 1975, the surface exploration program consisted of geological mapping, soil sampling and geophysical surveys. This surface work was designed to define the stratigraphy over the central part of the property, to locate known showings relative to this stratigraphy and to determine the mineralization potential of limestone along strike from the adit area. This work resulted in the planning of a drilling program for 1976. Since 1974, work on the property has been under the management of R.G. Hilker Limited.

LEGEND

CAMBRIAN

6	Argillaceous limestone, lime phyllite, hornfels
5	Black argillite, hornfels
4	Upper limestone
3	Middle argillite, hornfels
2	Lower limestone
1	Lower argillite, hornfels
A	Argillite, undifferentiated
L	Limestone-undifferentiated
	Sulphide surface showing
	Geological contact, inferred
	Fault
	Anticlinal axis
4	EAGLE claim number
	Claim post
	Adit



GEOLOGY OF THE MAIN SHOWING AREA,
TINTINA SILVER PROPERTY, 105G-3

Description:

Regional mapping shows the property to be underlain by Lower Cambrian limestone (Unit 1c, Wheeler et al, 1960b) and Middle to Upper Cambrian phyllite (Unit 2, op. cit.). On the northeast part of the property these rocks are intruded by Jurassic and/or Cretaceous granodiorite (Unit 9, op. cit.). At the contact of the granodiorite, the sediments have been altered to hornfels for distances up to three kilometres. Garnet-diopside-epidote skarn has been developed in limy sediments adjacent to the granodiorite contact.

Host rocks for the silver-lead-zinc showings on the property are Lower Cambrian sediments which have been separated into six distinct units, consisting of lower argillite overlain successively by lower limestone, middle argillite, upper limestone, black argillite and argillaceous limestone (see map). The lower argillite is a massive, brown to purplish-brown argillite with minor disseminated pyrrhotite. This unit is at least 90 metres thick but has been encountered only in drilling and its total thickness is unknown. The lower limestone is commonly mottled or streaky in appearance and locally argillaceous. Log-shaped boudins of limestone within argillaceous limestone are indicative of the deformation within this unit. White rings and cylindrical bodies resemble fossils of Lower Cambrian age. Thickness of the unit varies from 8 to 75 metres. The middle argillite unit is a strongly foliated, grey- to brown-coloured rock rich in pyrrhotite, pyrite and locally arsenopyrite. It varies from 15 to 45 metres thick and contains massive, siliceous bands up to one metre thick with a tuffaceous appearance. The upper limestone unit consists of grey to light grey limestone with only minor argillite content. It has a mottled appearance due to the presence of secondary stringers and patches of calcite and quartz, and appears to be the most favourable host for silver-lead-zinc mineralization. Its thickness is variable but averages 9 to 15 metres. The black argillite is a distinctive, black, carbonaceous, sulphide-rich argillite that is rusty weathering in outcrop and contains up to ten per cent pyrite and pyrrhotite. It has been the locus of thrust faulting and its thickness and spatial distribution are quite irregular. The argillaceous limestone is a thick unit of bedded, strongly sheared and folded argillaceous limestone.

Structure consists of a northwest-plunging anticline which is complicated by minor drag folds and abundant small-scale thrust and cross faults.

The silver-lead-zinc occurrences on the EAGLE claims (see map) have been divided into four separate groups. The first, and most important to date, consists of massive to disseminated sphalerite, galena and freibergite emplaced within the upper limestone. These occurrences are best developed in the crests of small anticlinal folds and notably at, or close to, the contact of the overlying graphitic, black argillite. The second group consists of disseminated sphalerite emplaced within the lower limestone. These occurrences are similar to those in the upper limestone but are less continuous and apparently less extensive. The third group is associated with thrust faults at the base of the argillaceous limestone and consists of pods and discontinuous lenses of massive galena, with minor sphalerite associated with secondary calcite and quartz veins. A fourth and less significant type of occurrence consists of minor chalcopyrite in quartz veins cutting mainly argillaceous limestone.

Current Work and Results:

During summer 1976, eleven diamond drill holes (BQ core) were drilled for a total footage of 4,036 feet. The drill program checked areas where electromagnetic conductors occurred near surface sulphide mineralization within the upper and lower limestone units. No mineralization of economic significance was encountered, though further surface exploration work and diamond drilling were recommended.

NMT
Noranda Exploration Company Limited

Zinc
105 G 5
(61°29'N, 131°53'W)

Reference: Wheeler *et al* (1960b).

Claims: NMT 1-16

Location and Access:

The property is located 15 km north of McNeil Lake in the St. Cyr Range. Access is by helicopter from Ross River, 80 km to the northwest.

History:

The claims were recorded in September 1976.

Description:

The property is underlain by Road River (?) shale and Cambro-Ordovician phyllite and volcanic rocks. Mineralization consists of hydrozincite and minor sphalerite in the shale.

Current Work and Results:

During summer 1976, the property was subjected to reconnaissance geological mapping and geochemical silt and soil sampling. Anomalous zinc response in the silt samples was attributed to minor zinc mineralization in the shale.

PELLY
Sovereign Metals Corporation

Lead, Zinc
105 G 6
(61°28'N, 131°20'W)

References: Wheeler *et al* (1960); 1975 M.I.R., Sinclair *et al* (1976).

Claims: PELLY 1-32

Location and Access:

The property is located 50 miles southeast of Ross River in the Pelly Mountains. Access is by helicopter from Ross River or by fixed wing to a bush air strip located 16 km northwest of the property in the Hoole River Valley. A 40 km winter tote road connects the property with the Robert Campbell Highway at Mink Creek.

History:

Airborne surveys (HEM) and stream silt analysis led to the staking of the EL claims in 1966 which were subsequently explored by soil sampling with

bulldozer trenching in areas of anomalous geochemical response. Sulphide mineralization was located in one such trench and four diamond drill holes were completed during 1967. A six foot intersection from hole N-1 gave the highest assay, 0.28 ounces silver per ton, 0.82 per cent lead and 2.49 per cent zinc. The EL claims lapsed and the area was restaked as the PELLY claims in June 1974 and March and June 1975. Soil sampling carried out in 1975 confirmed and extended the geochemical anomaly found by earlier work.

Description:

The area is underlain mainly by schistose rocks of probably Proterozoic age (Unit A, Wheeler et al, 1960). The principal rock types exposed on the property consist of chlorite-graphite schist, feldspar augen schist and quartz-sericite schist. Dunite of probably Paleozoic age (Unit D, op. cit.) is exposed northwest of the property. The regional strike of the schistosity is to the northwest, with gentle dips to the southwest. More complex structural relationships are represented locally by two or more directions of strong foliation.

Mineral occurrences on the property consist of blebs and disseminations of galena, sphalerite and pyrite within conformable bands in feldspar augen schist at or near the contact with overlying chlorite-graphite schist.

Current Work and Results:

During summer 1976, a reconnaissance geochemical soil sampling program for lead and zinc was conducted by St. Joseph Exploration Company. Survey lines were extended 700 metres down slope from the main showing and anomalous values in zinc were determined within 200 metres of the showing.

TIL
Mountaineer Mines Limited

Zinc
105 G 9
(61°42'N, 130°05'W)

Reference: Wheeler et al (1960b).

Claims: TIL 1-24

Location and Access:

The property is located 13 km south of McEvoy Lake and 10 km north of the Campbell Highway. Access is provided by helicopter from the Campbell Highway.

History:

The claims were staked in March 1975 by R. Darney and A. Harman and subsequently acquired by Mountaineer Mines in August 1976.

Description:

The property is underlain by shale, argillite and limestone of Lower Paleozoic age that have been intruded by a granodiorite stock. Mineralization consists of minor secondary zinc (hydrozincite?) disseminated along fractures in limestone.

Current Work and Results:

During summer 1976, the property was subjected to preliminary geological mapping and geochemical soil sampling programs. A total of 59 samples were collected at 500 foot intervals along lines spaced 700 feet apart and analyzed for Pb, Zn. A large anomalous area of coincident high Pb-Zn values overlying limestone was determined in the south central portion of the claim group. Further work was recommended by a consulting geologist to consist of detailed geochemical soil sampling, prospecting, geological mapping and a ground EM survey over the anomalous area.

BEV — 105 G 11
Hudson Bay Exploration and Development Company Limited — (61°29'N, to 61°42'N, 130°57'W to 131°22'W)

References: Wheeler et al (1960b); Sinclair et al (1976).

Claims: BEV 1-338

Location and Access:

The claims are situated in ten separate groups lying up to several kilometres apart south of the Robert Campbell Highway. Access in 1976 was by float equipped fixed wing aircraft and helicopter from Ross River.

History:

The claims were staked during the fall of 1974. Airborne surveys conducted in 1974 outlined a number of electromagnetic anomalies and in 1975, ground magnetic and EM-17 surveys were carried out on all claim groups and 2,359 feet of diamond drilling in 7 holes were drilled. The drilling is reported to have intersected mainly flat lying graphitic schists with minor disseminated pyrite. One of the holes, drilled on a magnetic anomaly, encountered serpentinite with minor pyrite.

Description:

Outcrop exposure on all the claim groups is very poor although the regional mapping indicates the area is likely underlain by metamorphic rocks of probable Lower Paleozoic age consisting of biotite and chlorite schists (Unit A, Wheeler et al, 1960). In the eastern part of the area these rocks are intruded by granitic rocks of Jurassic and/or Cretaceous age (Unit 9, op. cit.). No mineral occurrences have been reported although the underlying rocks are thought to be generally correlative to the schists and phyllites which host the massive lead-zinc deposits of the Anvil Range to the northwest.

Current Work and Results:

During summer 1976, minor trenching was conducted by a D-7 cat on the BEV 33-88 group and five diamond drill holes (BQ core) were drilled for a total of 1,956 feet. The drilling was performed on BEV 182-197, 192-253 and 254-302 groups and is reported to have similar results to the 1975 program.

GEM, BB — 105 G 13, 14
Yukon Revenue Mines Limited — (61°50'N, 131°30'W)

References: Wheeler et al (1960b); Tempelman-Kluit (1977).

Claims: GEM 1-17; BB 1-68; WATER 1-20; LAKE 1-17; JADE 1-12

Location and Access:

The property is located 55 km east of Ross River and 16 km north of the Robert Campbell Highway. Access is provided by helicopter or by foot from the highway.

History:

All the claims were recorded in 1976: GEM 1-16 in July, GEM 17 in August, BB in September and WATER, LAKE and JADE in November.

Description:

The property is underlain by phyllite, graphitic shale and greenstone of uncertain age. The former two have been tentatively assigned an Upper Devonian age by Tempelman-Kluit (Unit DCk, Tempelman-Kluit, 1977), though their age is masked by regional metamorphism and they may be correlative with the older Road River Formation.

A leached boxwork within quartz-graphite shale and phyllite has been interpreted as being residual after sphalerite, chalcopyrite and galena.

Current Work and Results:

During summer 1976, portions of the property were subjected to geological mapping, geochemical soil sampling, a reconnaissance magnetic survey and trenching. Reconnaissance scale geological mapping was conducted over the GEM 1-8 and BB 1-10 claims (1 inch = 500 feet, 1:50,000). Soil samples were collected along reconnaissance and detailed grid lines on GEM 3-8 and analyzed for Cu, Pb, Zn. A magnetometer investigation was made on a reconnaissance scale but response was poor and not deemed useful. Hand dug pits on GEM 4 and 6 totalled 40 cu. yd. in volume and further work consisting of diamond drilling was recommended.

IRENE — Zinc
Mountaineer Mines Limited — 105 G 16
(61°41'N, 130°15'W)

Reference: Wheeler et al (1960b).

Claims: IRENE 1-24

Location and Access:

The property is located two miles south of McEvoy Lake and 16 km north of the Robert Campbell Highway. Access is provided by float plane to McEvoy Lake from Ross River, 153 km to the southeast.

History:

The claims were staked in August 1972, by A. Harman who outlined several zones geochemically anomalous in copper and zinc. Vestor Explorations acquired the property in spring 1973 and in an evaluation program report, recommended a program of detailed geochemical sampling. Mountaineer Mines Limited acquired the claims in August, 1976.

Description:

The property is underlain by a sequence of Middle to Upper Cambrian phyllite, argillite, dolomite, quartzite and minor greenstone which has been intruded by a granodiorite stock. Along the southern portion of the claim group, an irregular band of hornfels has developed where the sedimentary rocks are in contact with the granodiorite intrusion. Mineralization consists of traces of sphalerite and secondary zinc minerals within a buff weathering white limestone in the southeast portion of the claim group.

Current Work and Results:

During summer 1976, a geochemical soil sampling program was conducted in the north central portion of the claim group. A total of 63 soil samples was collected at 400 foot intervals along lines 500 feet apart and analyzed for Pb and Zn. Combined with earlier Vestor data, the geochemical survey determined an east-west trending coincident Pb-Zn anomaly in the central portion of the claim group. The anomaly is over one kilometre long and over 330 m wide. Further work consisting of detailed geochemical soil sampling was recommended.

SUZANNE
Dual Resources Limited

Lead, Zinc
105 H 2
(61°14'N, 128°43'W)

Reference: Blusson (1966).

Claims: SUZANNE 1-16

Location and Access:

The property is located about 136 km north of Watson Lake and can be reached by the following road system: 77 km up the Cantung Road, west for 25 km on the Conglomerate Creek Road and then southwesterly by pack trail for 4.8 km to the property.

History:

The claims were staked in March 1974.

Description:

The property is underlain by Cambrian or older schist and gneiss which are overlain by Devonian and (?) Mississippian metasedimentary rocks. Mineralization consists of minor pyrrhotite and chalcopyrite in hornfels and several areas of galena-sphalerite mineralization with accessory pyrite, pyrrhotite and chalcopyrite in a limestone skarn. The best sample from the skarn assayed 0.01 per cent copper, 12.75 per cent zinc, 11.55 per cent lead, 0.004 ounces gold per ton and 0.45 ounces silver per ton.

Current Work and Results:

During 1976, preliminary geological mapping was carried out and grab samples were taken.

KING, ARCTIC
Arctic Jade Limited

Jade
105 H 3
(61°07'N, 129°26'W)

Reference: Roots *et al* (1966).

Claims: KING 5, 6; ARCTIC 1-3, Fr

Location and Access:

The property is located 5 km west of Milepost 85 on the Robert Campbell Highway, north of Watson Lake. Access to the property is by road to the base of the mountain slope from approximately Mile 87 on the highway and then a 680 m climb along a 5 km trail or by helicopter from Watson Lake, 120 km to the south.

History:

The claims were staked during July and September 1973, September 1975 and 1976.

Description:

The area is underlain by Mississippian-Devonian sedimentary rocks which are separated by an angular unconformity from underlying Cambrian and Pre-cambrian sedimentary rocks and intruded by numerous irregular to sill-like ultramafic bodies. On the KING property, the ultramafic body is completely serpentinized, strongly sheared and contains numerous large inclusions of recrystallized limestone and other sedimentary rocks. Margins of some, but not all the inclusions are altered to light green diopside, granular pink grossularite garnet, tremolite, nephrite, chlorite, epidote and probably clinozoisite. The irregular or lenticular masses of nephrite jade separate dark, tremolitized serpentine from alteration assemblages and silicified metasedimentary rocks which resemble ribbon chert.

The main jade occurrence consists of a series of jade lenses on KING 5 claim trending northerly down a steep slope and dipping northeasterly under a shallow capping of diopside and siliceous to phyllitic metasediments. In addition, several other outcrop and float occurrences of jade have been located on the property.

Current Work and Results:

During summer 1976, the property was subjected to preliminary geological mapping and several hundred feet of short hole diamond drilling in 102 holes averaging 2-3 feet in depth. Examination of the core showed the jade to vary from poor to medium in quality with much of it somewhat opaque, talcose and softer than desired for good quality gem grade. No further drilling was recommended, though the potential high tonnage of lower grade jade was recognized.

GREEN STUFF 105 H 5
Petra Gem Exploration of Canada Limited (61°16'N, 129°46'W)

Reference: Roots *et al* (1966).

Claims: GREEN STUFF 1-6

Location and Access:

The claims are located 13 km west of kilometre 160 on the Robert Campbell Highway, 160 km northwest of Watson Lake. Access is provided by helicopter from Watson Lake or by cat road from the Highway.

History:

The claims were recorded in March 1976 to cover ground earlier held as the SOWDEN claims and are now owned by G. Bouchard, Kelowna B.C.

Description:

The property is underalin by chlorite-quartz, quartz-mica, and tremolite schists of Mississippian age which trend in a southeast direction and dip moderately to the southwest. Dykes of porphyritic monzonite and syeno-gabbro and lenses of serpentininzed ultramafic rocks intrude the schists. Alteration pods in the serpentine consist of massive diopside with minor garnet and vesuvianite. Jade bearing float occurs on the property, however, no jade was reported to occur *in situ*.

Current Work and Results:

During summer 1976, the claims were geologically mapped and prospected. A consulting geologist recommended no further work on the property.

SUSAN Tungsten
Union Carbide Canada Mining Limited 105 H 8
(61°26'N, 128°20'W)

References: Blusson (1966).

Claims: SUSAN 1-38

Location and Access:

The property is located 8 km west of Mile 61 on the Cantung Road along Flood Creek. Access is provided by helicopter from Watson Lake, 161 km to the south.

History:

The claims were staked in June and August, 1975, the northwest portion adjoining onto the former MONTSE claims.

Description:

The claims are underlain by a biotite quartz monzonite batholith which is in contact with metasedimentary rocks to the east. The metasedimentary rocks consist of marble interbedded with pyrrhotite-rich micaceous quartzite, calc-silicate and a series of schists and quartzites.

Mineralization consists of pyrrhotite-rich skarn with very minor pyrite, sphalerite, scheelite and rare galena.

Current Work and Results:

During summer 1975, the property was subjected to EM-16 and magnetometer surveys along 12,000 feet of grid lines spaced 500 to 1,000 feet apart and detailed geological mapping (1 inch = 100 feet). Overlapping magnetic and electromagnetic anomalies were determined subparallel to a monzonite-metasediment contact and two diamond drill holes (257 feet and 235 feet) were collared to intersect the anomalous conductor. Both holes intersected low grade Fe-Zn-Pb sulphide mineralization and graphite. In addition, very low grade scheelite mineralization was encountered near the bottom of one hole.

During 1976, the geophysical coverage was expanded to further trace and define the magnetic conductor. One additional diamond drill hole (150 feet) was collared to intersect a scheelite geochemical anomaly above the geophysical anomaly and hand trenching and blasting exposed a near surface suboutcrop of the massive pyrrhotite skarn. Both the drill hole and the trench encountered only weakly disseminated scheelite mineralization.

REA
Mountaineer Mines Limited

Copper, Zinc, Lead
105 H 10
(61°40'N, 128°42'W)

Reference: Blusson (1966).

Claims: REA 1-16

Location and Access:

The property is located in the Logan Mountains, 8.1 km east of Anderson Lake and 19.3 km west of the Cantung Road. Access is provided by float plane to Anderson Lake from Watson Lake, 171 km to the south, and then by foot or helicopter to the property. Alternatively, access is provided by road to Mile 60 on the Cantung Road and then by helicopter to the property.

History:

Lead-zinc-copper mineralization in the area was discovered by prospector Hugo Brodell. The property was optioned in 1966 by Atlas Explorations, who did some preliminary exploration in 1967. The claims were allowed to lapse, were restaked by T. Brock in February 1975 as the REA group and subsequently acquired by Mountaineer Mines.

Description:

The property is underlain by metasediments of Proterozoic age that have been intruded by a granodiorite batholith. The metasediments consist of biotite-hornblende schist and gneiss with minor sandstone and quartzite, locally calcareous. Intrusive sills and dykes and associated silicification become more prominent as the granodiorite contact is approached.

Mineralization consists of erratically distributed zones of pyrrhotite, minor chalcopyrite, sphalerite and galena within the silicified portions of some metasedimentary units. Several of the small local fold crests contain silicified and oxidized zones of pyrrhotite.

Current Work and Results:

During summer 1976, the property was subjected to detailed prospecting and preliminary geological mapping. The showings were shown to be small in size and no further work was recommended by a consulting geologist.

Shannon Creek
Noranda Exploration Company Limited

Lead, Zinc, Tungsten
105 H 14, 15
(61°52'N, 128°59'W)

References: Roots *et al* (1966); Findlay (1969).

Claims: LOG 1-28

Location and Access:

The property is located 43 km west of Tungsten, N.W.T. Access is provided by helicopter.

History:

The claims were recorded in September 1976 over ground formerly held as the ZEUS claims by Spartan Explorations Limited in 1967 (Findlay, 1969).

Description:

The property is underlain by sedimentary rocks of Hadrynian age that are contact metamorphosed by a Cretaceous granodiorite stock. Mineralization consists of minor sphalerite, galena, chalcopyrite and scheelite.

Current Work and Results:

During summer 1976, the property was subjected to geological mapping (1 inch = 400 feet), detailed prospecting, geochemical soil sampling and a VLF-EM survey. Several weakly mineralized skarn zones were located by prospecting and several soil anomalies were outlined.

HOWARDS PASS
Canex Placer Limited
United States Steel Corporation

Lead, Zinc
105 I 6, 11, 12
(62°27'N, 129°11'W)

References: Green *et al* (1967); Blusson (1968); Gabrielse *et al* (1973); Craig and Milner (1975, p. 124); Sinclair and Gilbert (1975, pp. 85-90); Ludvigsen (1975); Sinclair *et al* (1975, pp. 159-160, 1976, pp. 168-169).

Claims: DON; OP; R; X; Y; ANNIV: total of 444 claims

Location and Access:

The property is situated in the Selwyn Mountains along the Yukon-Northwest Territories border, 161 km east-northeast of Ross River and 260 km north of Watson Lake. The main showings on the property are at elevations of 1,500 to 1,800 metres. Access in 1975 was primarily by fixed wing aircraft from either Ross River or Watson Lake to an 545 metre airstrip on the property. Heavy equipment can be brought to the property via a winter tote road which leaves the Nahanni Range Road at Mile 101 (Km 162.5).

History:

High grade showings of lead and zinc were discovered by Canex Placer following geochemical surveys carried out in 1968 and 1971. From 1973 to 1975, the company carried out extensive surface exploration including 52 diamond drill holes totalling over 33,000 feet.

Description:

The property is underlain by Paleozoic sediments consisting of, from oldest to youngest: Upper Cambrian and (?) Ordovician limestone, locally referred to as the "wavy-banded" limestone, (Unit 7b, Green et al, 1967); up to 300 metres of black, graphitic and graptolitic shales of the Ordovician Road River Formation (Unit 10, op. cit.); and over 900 metres of siliceous shale, sandstone and chert-pebble conglomerate of Devono-Mississippian age (Unit 18, op. cit.). Extremely fine-grained galena and sphalerite occur in thin, conformable laminae in a black, graphitic horizon in the Road River Formation, roughly 60 metres above the lower contacts with the "wavy-banded" limestone. Secondary lead-zinc minerals such as smithsonite, cerussite and particularly hydrozincite have been observed in surface showings.

Current Work and Results:

In 1976, the program on the property included detailed geological mapping, trenching and the following diamond drilling: 20,479 feet in 37 drill holes on the XY, 10,693 feet in 30 holes on the ANNIV and 820 feet in 2 holes on the OP claim group.

TANG — 105 I 12
Ogilvie Joint Venture — (62°37'N, 129°45'W)

Reference: G.S.C. Map 8-1967.

Claims: TANG 3-16

Location and Access:

The claims are located in the Selwyn Mountains about 161 km east-northeast of Ross River, 10 km west of the Yukon-Northwest Territories border. Access is provided by helicopter from Ross River.

History:

The claims were recorded in August 1975.

Description:

The property is underlain by argillite of the Ordovician Road River Formation and Devono-Mississippian argillite, conglomerate and sandstone. The units are broadly folded into a northwesterly-trending syncline. A bedded barite horizon occurs at the base of the Devono-Mississippian argillite and extends onto the adjacent ORO property.

Current Work and Results:

During summer 1976, the property was geologically mapped at a scale of 1 inch = 1/2 mile and reconnaissance geochemical silt samples were taken from several creeks west of the barite horizon. Several high zinc values were obtained and a program of detailed soil sampling and geological mapping was recommended.

SEL
Trident Resources Inc.

Gold, Silver, Copper
Zinc
105 I 13
(62°51'N, 129°53'W)

References: Green et al (1967); Sinclair and Gilbert (1975).

Claims: SEL 1-34, 69-98, 102, 104, 106, 108, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204

Location and Access:

The property is located 177 km northeast of Ross River in the Itsi Range of the Selwyn Mountains. Access is provided by helicopter from Ross River.

History:

Most of the claims were staked in late summer, 1973, following the discovery of gold-bearing quartz veins and a total heavy metal geochemical anomaly during the course of prospecting and regional soil and silt sampling. In 1974, the western part of the property was geologically mapped and soil sampled for lead and zinc. Several zinc anomalies were outlined along the base of a ridge in the central part of the property. In late summer 1976, SEL 1-34, 180, 182 and 186 were staked and added to the group.

Description:

The property is underlain by clastic and chemical sedimentary rocks of Lower Paleozoic age;

- brown weathering shale with minor pyrite
- silvery weathering shale
- brown to rusty shale, sandy near the base with numerous quartz stringers locally
- black shaly chert and massive chert

In addition, fragments of pebble conglomerate and banded barite interbedded with black chert and sandstone occur within the talus between the brown shale and the chert unit. The rocks are intensely folded and form the eastern limb of a northwesterly plunging anticline.

Mineralization consists of arsenopyrite, pyrite and chalcopyrite within several zones (one up to 6 m wide) of narrow quartz veinlets in the black shale unit. The best mineralized sample assayed 1.35 oz Ag/ton, 0.480 oz Au/ton and 2.30 % Cu. In addition, several large gossans derived from pyritic shale and chert contained low values of zinc.

Current Work and Results:

During summer 1976, the property was subjected to programs of geological mapping; geochemical soil sampling and trenching (11 trenches). The geochemical work consisted mainly of total heavy metal determinations in the field supplemented by some laboratory analyses. Results of work on the gossans were not encouraging and any further work was recommended to be directed toward trenching and sampling of the quartz vein zones.

PIG | 105 J 2
Cyprus Anvil Mining Corporation | (62°14'N, 130°36'W)

Reference: Roddick and Green (1961).

Claims: PIG 1-50

Location and Access:

The claim group is located 18 km northwest of Traffic Mountain and adjoins the KATE group to the west. Access is provided by helicopter from Ross River, 97 km to the southwest or by a combination of helicopter and float equipped fixed wing from Pelly Lakes, 29 km southeast of the property.

History:

The claims were recorded in July 1976 and were staked to cover an area with anomalously high stream geochemical lead values.

Description:

The property is underlain by interbedded black to grey chert, black shale and minor carbonates of Ordovician to Silurian age that occur along the eastern margin of the Pelly-Cassiar platform. No mineralization has been observed on the property.

Current Work and Results:

During summer 1976, a geochemical soil sampling program was conducted on the property. A total of 750 soil samples were collected at 200 foot intervals along grid lines spaced 400 and 800 feet apart and analyzed for Cu, Pb, Zn. Two east-west trending irregular lead anomalous zones were determined at the western boundary of the claim group. Sporadically high zinc values occur throughout the anomalous zones. The anomalies are sub-parallel to bedding and may reflect stratiform lead mineralization in black shale. Further work consisting of more geochemical soil sampling, detailed geologic mapping, prospecting, and electromagnetic surveys were recommended by a company geologist.

Itsi Lake | Zinc, Lead
Abacorn Syndicate | 105 J 9, 16
(62°43'N, 130°15'W)

Reference: Blusson (1974a).

Claims: ITSI 1-48; PRE 1-24; VOST 1-24; RIVER 1-24

Location and Access:

The property is located about 32 km east of Mount Sheldon on the Canol Road and 8 km south of Itsi Lake. Access is provided by helicopter from Ross River, 193 km to the southwest or by helicopter from Jeff Lake on the Canol Road (32 km to the north).

History:

The ITSI and VOST claims were staked in July 1975, the PRE claims in August 1975 and the RIVER claims in September 1975.

Description:

The property is underlain by Cambrian and Ordovician shale and limestone that have been subdivided into the following sequence:

Ordovician:	Road River Formation
	Upper siliceous shale
	Clay flake mudstone
	Chert unit with limy and shaly horizons
	Lower shale unit
	Transitional limestone
Cambrian:	Wavy banded limestone

In general, the units trend westerly and dip steeply to the south.

Mineralization of several types has been noted: 1) fine grained pyrite as layers and disseminated grains in the lower and upper siliceous shale units; 2) pyrite as coarse nodules or balls within the wavy banded limestone and thin bedded black shale; 3) pyrite layers in black chert with very minor sphalerite (?) and galena; 4) smithsonite and hydrozincite as fracture cleavage fillings and bands up to 1.3 cm thick parallel to the bedding in chert; 5) horizontally layered surficial deposit of zinc-bearing travertine located with V-shaped valleys or along steep slopes.

Current Work and Results:

During summer 1976, preliminary geological mapping (1 inch = 400 feet) was carried out on the property. Soil, water and rock samples were tested with a total heavy metal geochemical kit and where results were positive, soil geochemical sampling on a grid was also carried out. All the samples were analyzed for zinc and some for lead. Several anomalous areas were determined and further work consisting of detailed geological mapping, grid geochemical soil sampling, trenching and diamond drilling was recommended.

COAL REPORTS

TANTALUS BUTTE MINE
Cyprus Anvil Mining Corporation

Coal
115 I 1
(62°08'N, 136°16'W)

References: Bostock (1936, pp. 59-62); Green (1966, pp. 121-124); Findlay (1967, p. 88; 1969a, p. 15; 1969b, pp. 66-67); Craig and Laporte (1972, pp. 155-156); Sinclair and Gilbert (1975, pp. 121-122); Sinclair *et al* (1975, p. 168; 1976, p. 172).

Lots and Leases: Leases 2949-2955, 2959, 2963-2980; Lots 23, 24, 10, 11

Location and Access:

The mine is situated on the north bank of the Yukon River, 6.4 km north of Carmacks and 1 km from the Whitehorse-Mayo Road.

History:

The Tantalus Butte Mine began operation in 1923, supplying coal to Carmacks and Dawson and later the mill at United Keno Hill Mines, Elsa, until 1967. In 1969, the mine began supplying coal to the Anvil Mine where it is used for plant heating and concentrate drying.

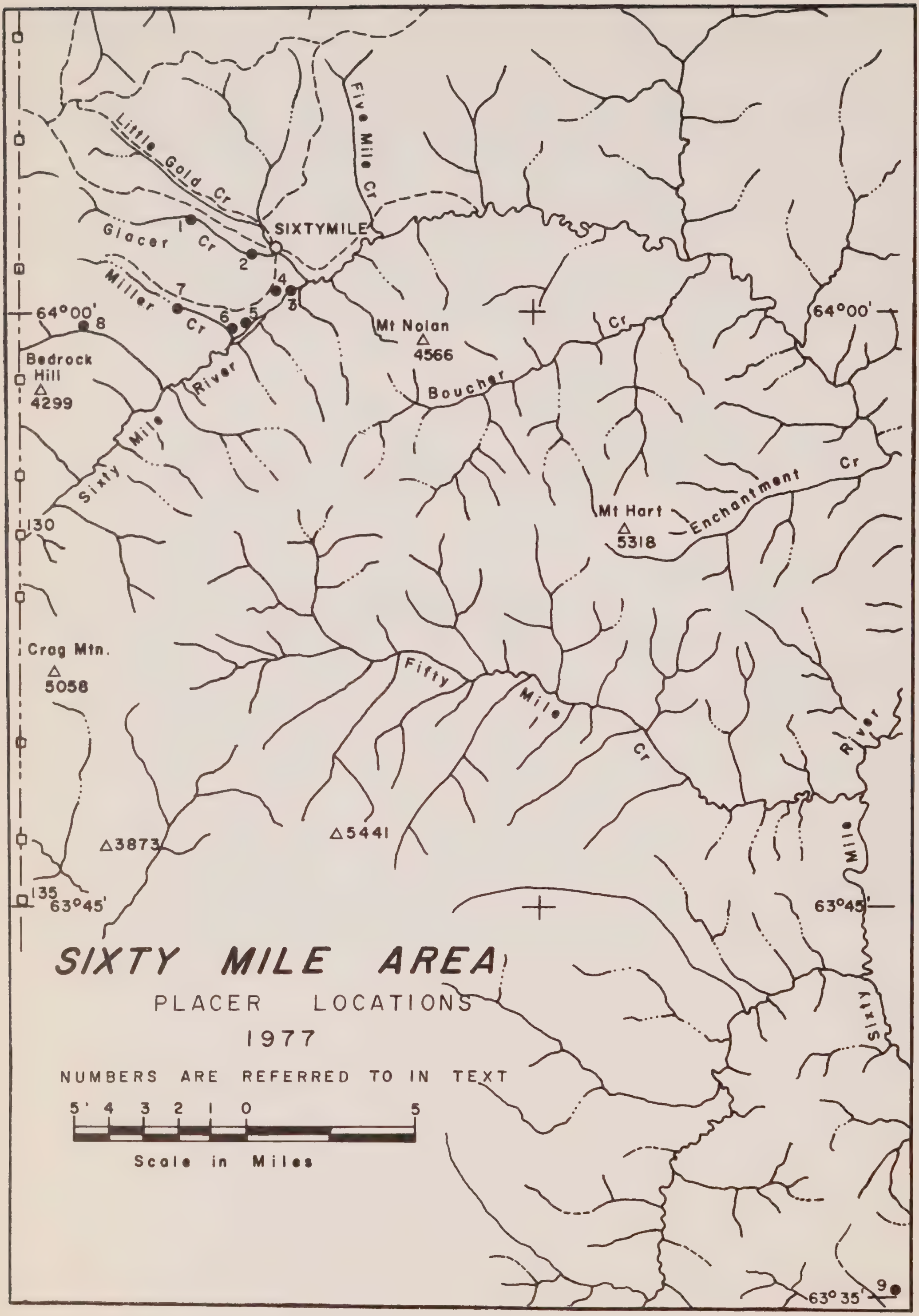
Description:

The coal occurs in the Tantalus Formation of Upper Jurassic (?) and Lower Cretaceous age, consisting of conglomerate with lesser amounts of sandstone, shale and a few coal seams. The main seam ranges from 0 to 14 feet thick, strikes north and dips 45° to 70° west. The seam is displaced by steeply-dipping, northeast- to northwest-trending faults. Although fault displacement is only on the order of a few feet or more, mining is rendered difficult. The coal is a high volatile, bituminous coal with calorific value ranging from 11,000 to 12,700 BTU. Samples are agglomerating with a swelling index of 1 (ASTM) and are not suitable for metallurgical grade coke (Green, 1966, p. 124). There is also another coal horizon near the top of the Laberge Group (Lower to Middle Jurassic).

Current Work and Results:

Exploration work in 1976 consisted of geological mapping, bulldozer trenching and the drilling of 16 diamond drill holes of HQ size for a total footage of 10,070 feet (3,069 m). Production was 9,974 tons underground and 20,000 tons open pit.

PLACER REPORTS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PLACER LOCATIONS
1977
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SIXTYMILE AREA

(1) J. Lynch
Glacier Creek

116 C 2
(64°02'N, 140°53'W)

Reference: Sinclair et al (1976, p. 174).

J. Lynch continued mining as in 1975 with one employee, a 2,500 gpm pump, monitor and two D-7 bulldozers. Some 11,000 bedrock square feet were mined on Grimard Discovery Claim from a right limit cut 175 feet long by 75 feet wide. As before, the method was to strip overburden, pile the 8 feet of pay gravels and upper 2 feet of quartz mica schist bedrock in front of the sluice box, wash with monitor to remove fines and then push the material into the box. Production was 300 crude ounces of gold.

(2) Glacier Creek Placers
Glacier Creek

116 C 2
(64°02'N, 140° 49'W)

Reference: Sinclair et al (1976, p. 174).

L. Grimard and E. Faucher with 2 other hired men continued mining their Glacier Creek property, putting in 7 left limit cuts each 100 by 125 feet, immediately upstream from the 1975 workings. Stripping of the 25 to 30 feet of fine, grey, uniform silt was done with a D-8 bulldozer. Eight feet of gravel and a foot of bedrock is mined using 2 D-6's.

(3) Cogasa Mining Corporation Limited
Sixtymile River

116 C 2
(64°01'N, 140°42'W)

Reference: Sinclair et al (1976, p. 174).

This large operator holds 44 miles of placer leases on the Sixtymile River and other leases in the area (see Sinclair et al, 1976). During the 1976 season an area 500 feet by 600 feet on the left limit of the river was mined. The gravel section is 8 to 9 feet thick; 2 to 3 feet of muck having been stripped in 1975. Three TD-25 bulldozers were used to feed a conveyor washing plant with screens over the dump box for rejection of coarse material. Rubber tired front end loaders (a 5 yard Hough 80 model and a 4 yard Hough 60) were used to stack tailings.

(4) Fellhawk Placers
J. and W. Fellers
Sixtymile River

116 C 2
(60°01'N, 140°41'W)

Reference: Sinclair et al (1976, p. 176).

Mr. and Mrs. Fellers mined on the left limit bench of the Sixtymile River immediately upstream from the mouth of Glacier Creek. The bench is roughly 30 feet above the Sixtymile River and about 600 feet from the river. They used two D-7's and one D-8, each machine operating part time.

The section consists of a few feet of muck followed downward by 20 feet of gravel to a dark grey to purple andesite bedrock which is in part decomposed in part fresh and blocky. The bottom 6 feet of gravel and top foot of andesite is sluiced. They mined some 850 feet of the bench from near the downstream end of a one mile lease in a series of 4 cuts up to 200 feet wide. Water is largely that filtering through gravels from upstream operations which is ponded and pumped to the sluice box.

(5) Adrian Brisboise 115 N 15
Sixtymile River (63°59'N, 140°49'W)

Reference: Sinclair et al (1976, p. 176).

Working on Sixtymile Bench Discovery Claim Mr. Brisboise put in one cut 300 feet long by 100 feet wide by 50 feet deep on this left limite bench. The gravel section is rather uniform in size of cobbles, there being little very coarse material. The lowest 6 feet is sluiced. Equipment used was a D-9 bulldozer.

(6) Alphonse Brisboise 115 N 15
Sixtymile River (63°59'N, 140°50'W)

Reference: Sinclair et al (1976, p. 176).

Mr. Brisboise put in one cut on the left limit Sixtymile bench immediately below the mouth of Miller Creek, 30 feet wide, 350 feet long and up to 40 feet deep, the lower 6 feet of which is sluiced. A second cut of 30 feet further into the bank was much less productive. Total output was 430 crude ounces of gold. Equipment used was a D-8 and a rubber tired front end loader.

(7) Sixtymile Enterprises 115 N 15
Sixtymile River (63°59'N, 140°47'W)

Reference: Sinclair et al (1976, p. 176).

W. Yaremcio mined claim 10 Above Discovery on Miller Creek, putting in a left limit bench cut about 100 feet wide by 300 feet long and to 50 feet deep using 2 D-7 bulldozers. Some 10 feet of muck, increasing to 20 to 30 feet at the deeper end, overlies the gravels. The muck here is characterized by abundant roots and trees.

This ground has been drifted several times during the placer mining history of the area. Hand mining was done there at the turn of the century; O. Medby sank a shaft and drifted prior to 1963. The most recent testing was done by F. Chudy and W. Yaremcio in 1969 when they put a shaft down 45 feet to bedrock, using a steam boiler, then drifted some 30 feet on a pay streak.

(8) S. Prohaszka 115 N 15
Bedrock Creek (63°59'N, 140°55'W)

Reference: Sinclair et al (1975, p. 177).

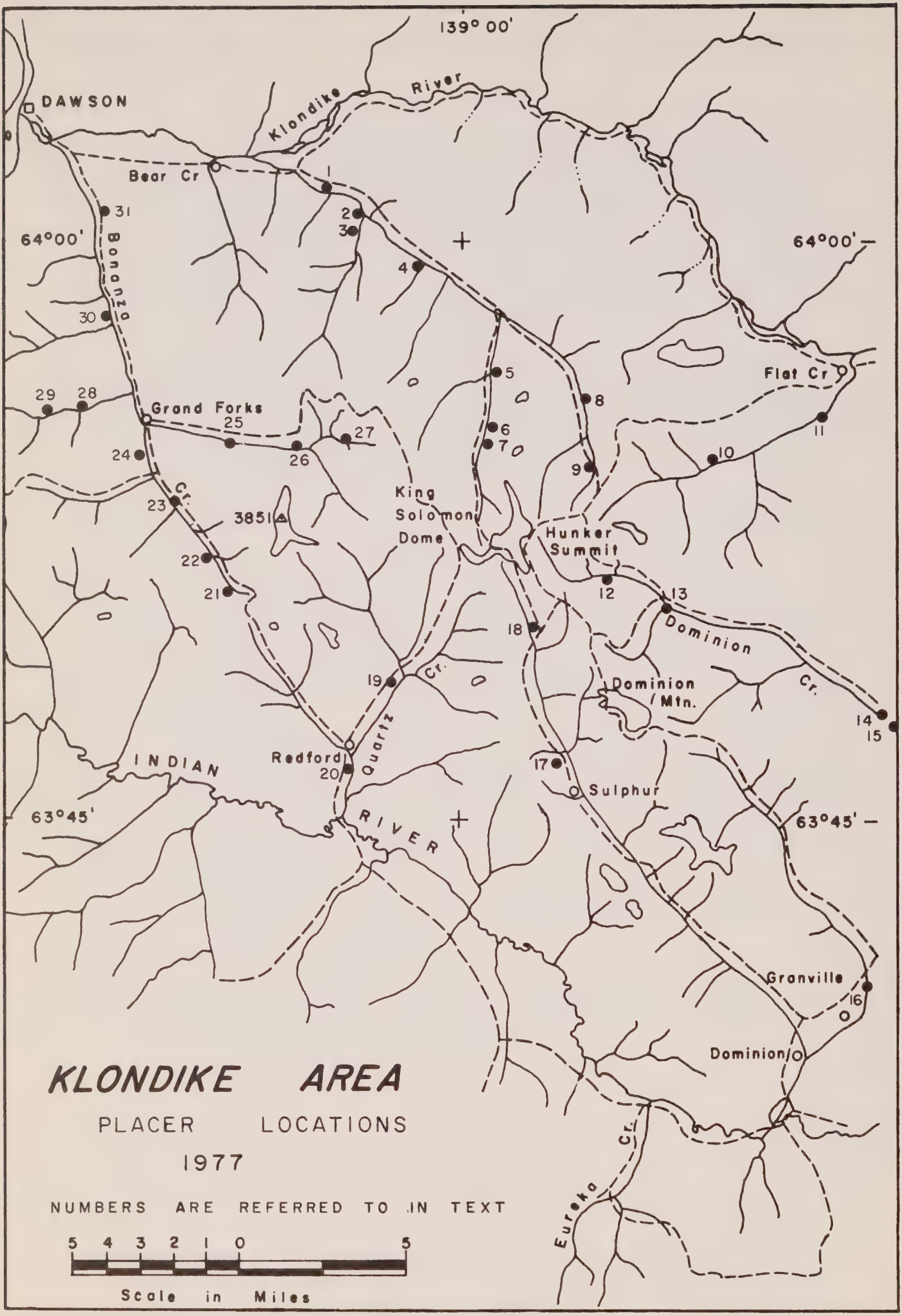
S. Prohaszka worked on Bedrock Creek, doing minor stripping and putting in one bench cut 100 feet by 100 feet, sluicing 4 feet of gravel and broken bedrock. Equipment used was a D-7 bulldozer.

(9) Oak Bay Manor-Ten Mile Mining — 115 N 8
Ten Mile Creek — (63°35'N, 140°05'W)

Reference: Sinclair et al (1976, p. 176).

This company continued mining its holdings on Ten Mile Creek about two miles upstream from the junction with the Sixtymile River. During the season the company put in a series of 8 right limit cuts on Claims 2 to 6 inclusive, mining an area 500 feet wide by 1,500 feet long. The total section here is about 25 feet thick with 6 to 8 feet of muck and 5 to 8 feet of barren gravel being stripped and the pay zone, averaging 10 feet, being sluiced. The bedrock is a blocky marble with much gold being caught in cracks. Unlike the soft schist bedrock at many other properties, this marble makes mining of the upper two feet or so of bedrock difficult.

They operated part of the season with 2 D-8 bulldozers, adding a third D-8 and a 980-B 5 1/2 yard front end loader in July of 1976. Fuel and heavy equipment was brought up the Yukon by barge to the mouth of the Sixtymile and from there to the property over an access tote road. Light servicing during the mining season was done by helicopter from Dawson City.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KLONDIKE AREA
PLACER LOCATIONS
1977
NUMBERS ARE REFERRED TO IN TEXT
5 4 3 2 1 0 5
Scale in Miles

KLONDIKE AREA

(1) K. and J. Tatlow — 116 B 3
Hunker Creek — (64°01'N, 139°09'W)

Reference: Sinclair et al (1976, p. 177).

The Tatlows mined on lower Hunker Creek putting in one cut of 11,000 bedrock square feet on the extreme right limit (Claim 24) and cuts totalling 21,000 bedrock square feet on the left limit (Claims 14 and 16). The left limit section consists of up to 50 feet of muck - an ice rich silt containing some ice lenses to 20 feet thick, with 1 to 2 feet of pay gravel at the base. On the right limit an average of 12 feet, locally to 20 feet, of overburden rests on 3 feet of pay gravels. Equipment was one D-8 bulldozer.

(2) Miben Mining Limited — 116 B 3
Hunker Creek — (64°00'N, 139°06'W)

Reference: Sinclair et al (1976, p. 177).

M. Stutter and B. Warnsby continued mining their bench claims on Dago Hill on the left limit of Hunker Creek. Water is pumped 340 feet up the hill and delivered to the monitors at a 160-foot head. The 500 h.p. vertical turbine pump delivers 4,200 gpm at this pressure. They mined 200,000 cubic yards of White Channels gravels, sluicing the entire section which, in places is greater than 100 feet thick. Moving of pipe and bulldozing of some of the gravels is done by one D-6, one D-7 and one 824 Caterpillar rubber-tired bulldozer. The company uses two sluice-boxes with an effective overhead manifold system of directing water into the boxes. Beyond the sluice-boxes, steel flumes, one 250 feet long, the other 400 feet long in 1976 carried the tailings to the edge of the hill. Riffles placed in these flumes during the current season recovered fine gold far down the tailings flumes.

(3) I. and G. Bremner — 116 B 3
Last Chance Creek — (64°00'N, 139°07'W)

Reference: Sinclair et al (1976, p. 177).

The couple mined on Bryan Bench of Discovery Hill on the left limit of Last Chance Creek about 300 feet above the creek. They operate with a gravity system conveying the water by means of a ditch 5 miles long to a pipeline and monitor. The section consists of White Channel gravels to 50 feet thick. At the base is a blue clay, a decomposition product from the underlying volcanic bedrock. 8,000 bedrock square feet were mined in a season of chronic water shortage.

(4) A. Kosuta — 116 B 3
Eighty Pup — (64°00.5'N, 139°05'W)

Reference: Sinclair et al (1976, p. 177).

Mr. Kosuta, using a monitor, stripped black muck containing some bones and ivory from Claim 1 on Eighty Pup, a left limit tributary, of Hunker Creek. The cut is 125 feet long by 50 feet wide. The silt, 40 feet deep, overlies 4 feet of pay gravels which rest on andesite bedrock. Also during the 1976 season he sluiced a bench on Creek Claim of Independence Creek, making a cut 100 feet long by 60 feet wide and 6 feet deep using a D-6 bulldozer and monitor.

(5) O. and M. Lunde — 115 0 15
Gold Bottom Creek — (63°57'N, 138°59'W)

Reference: Sinclair et al (1976, p. 178).

This couple mined on Claim 14 above the mouth on Gold Bottom Creek, completing a centre cut of 20,000 bedrock square feet and a left limit cut of 22,000 bedrock square feet. They sluice the bottom 4 feet of a gravel section which averages 9 feet thick. They used a D-7 bulldozer until mid-August and completed the season with a TD-15.

(6) M. and D. Crockett — 115 0 15
Gold Bottom Creek — (63°55'N, 138°59'W)

Reference: Sinclair et al (1976, p. 178).

The Crocketts put in 4 full width cuts across Gold Bottom Creek on Claims 36 and 37, each 140 feet wide by 110 feet long, using a D-8 bulldozer. The gravel and silt section totals 12 feet of which the bottom 4 feet are sluiced.

(7) O. Juuso — 115 0 15
Gold Bottom Creek — (63°54'N, 138°59'W)

Mr. Juuso holds 5 claims above Crockett on Gold Bottom Creek. Starting in 1976 he worked 3 months, partly with a 2 1/4 yard front end loader and partly with a D-8 bulldozer. He sluiced the bottom 2 feet of a cut 200 feet long by 100 feet wide on his second claim up the creek.

(8) J. Erickson, H. Liedtke — 115 0 15
Hunker Creek — (63°54'N, 138°53'W)

These men mined on Claim 2 Above Discovery on Hunker Creek, working both sides of the creek and sluicing one cut 200 feet long by 50 feet wide using a D-8 bulldozer and pump driven monitor. The section ranges from 9 feet in the creek to 40 feet at the lateral limit. The bottom 6 feet is gravel, the remainder black silt muck.

(9) P. Erickson, D. Gritzka — 115 0 15
Hunker Creek — (63°54'N, 138°53'W)

Reference: Sinclair et al (1976, p. 178).

These operators mine on Claim 26 Above Discovery in the narrow Right Fork of Hunker Creek. During the 1976 season, working with a D-4 traxcavator and part time use of a D-8, 2 cuts were put in - one of 4,000 bedrock square feet and one of 3,000 bedrock square feet. The mined area ranges from 30 to 60 feet in width.

(10) J. Stewart — 115 0 15
Allgold Creek — (63°54'N, 138°45'W)

This operator, starting in 1975, mined about 35,000 bedrock square feet that year and a further 35,000 bedrock square feet in 1976. Workings are on a left limit bench 125 feet above the creek. Water for sluicing is pumped from the creek.

(11) K. and S. Placers 115 O 15
Allgold Creek (63°56'N, 138°37'W)

Reference: Sinclair et al (1976, p. 181).

Kinakins, working on claims 7 and 8 above the mouth on Allgold Creek mined a strip on the right limit bank 30 feet wide by 800 feet long, the gravel section here is 9 feet thick, all of which is sluiced. Equipment used was 2 D-7 bulldozers.

(12) Ian Hamilton 115 O 15
Dominion Creek (63°52'N, 138°52'W)

Mr. hamilton holds claims on the upper part of Dominion Creek near Discovery Pup. Starting in 1973 he put in a drain and further preparatory work including stripping during 1974 and 1975. during 1976 he did further stripping and a minor amount of sluicing.

(13) A. and N. Burgelman 115 O 15
Dominion Creek (63°50'N, 138°49'W)

Reference: Sinclair et al (1976, p. 179).

Operations were largely stripping at the mouth of Caribou Creek a right limit tributary of Dominion Creek.

(14) A. and N. Sailer 115 O 15
Dominion Creek (63°48'N, 138°36'W)

Reference:

Mr. and Mrs. Sailer continued to mine on the left limit bench of lower Dominion Creek downstream from the mouth of Nevada Creek. Working part of the time with a D-8 and the rest with a D-6 they mined 40,000 bedrock square feet on the Nazareno Claim (opposite Creek Claim 81) where the section consists of 8 to 10 feet of muck and 10 to 12 feet of gravel. A monitor is mounted on the sluice box to break up and help wash the gravel. Stripping of muck and sand from 40,000 bedrock square feet of Claims 85 and 86 was done in preparation for the 1977 season.

(15) G.A. and L.W. Gatenby
Dominion Creek (63°46'N, 138°35'W)

During 1976 the Gatenbys, working partly by hand and partly using a one-half yard front end loader, sluiced approximately 500 cubic yards of high grade gravels on Claims PAT 8, 9 and 10 on Dominion Creek just above the mouth of Hunter Creek. Mining is on a low left limit bench, formerly mined by dredge. The pay gravels form a remnant ridge which had constituted the dyke which retained the dredge pond.

(16) D. Rintoul 115 O 15
Dominion Creek (63°45'N, 138°31'W)

Reference: Sinclair et al (1976, p. 179).

Mr. Rintoul mined part of the season on lower Dominion Creek using a system of draglines to mine below water level. One dragline moved gravels directly into the dump box, the other was used to stack tailings.

In preparation for future mining on his 2 mile lease on upper Gold Run Creek, a right limit tributary of Dominion Creek, Mr. Rintoul stripped by monitor 2.5 feet of overburden from an area 100 feet by 80 feet. He sank a shaft on this prospect during October and November. The section, from the base up, consists of broken chlorite quartz schist rubble from the bedrock, 6 feet of gravel and 15 feet of silty muck.

(17) R. and B. Gibson — 115 O 15
Sulphur Creek — (63°47'N, 138°54'W)

Reference: Sinclair et al (1976, p. 179).

Mr. and Mrs. Gibson hold 16 claims down Sulphur Creek from the mouth of Friday Gulch and a total of 21 claims in the area. During 1976 they mined 20,000 bedrock square feet (200 feet by 100 feet) from the Sulphur Bench at Friday Gulch on the Lucky Lady claim. About 10 feet of grey brown silt is stripped. The lower few feet of gravel and upper 2 feet of slabby quartz-muscovite schist bedrock is sluiced.

(18) K. Djukestein — 115 O 15
Sulphur Creek — (63°50'N, 138°55'W)

Reference: Sinclair et al (1976, p. 179).

As in 1975, Mr. Djukestein operated with two 12 yard highway scrapers, a D-7 and a D-8 bulldozer. During 1976, with 2 hired men he mined 100,000 bedrock square feet in a cut 500 feet long by 200 feet wide. The ground was that originally prepared for dredging in the late 1950's and early 1960's. The bottom 6 to 10 feet of the present 18 feet of section is sluiced. 1976 production was 816 crude ounces gold.

(19) R. and L. Mining Company — 115 O 14
Quartz Creek — (63°48'N, 139°04'W)

Reference: Sinclair et al (1976, p. 180).

W. Rasmusson and J. Lacross continued mining on Quartz Creek on Claim 5 Below Amax Discovery. They completed two centre cuts below the forks, one of 45,000 bedrock square feet, the other of 50,000 bedrock square feet. They stripped 25 feet of black muck overburden from 150,000 square feet on the left limit of Quartz Creek in preparation for 1977 mining. They used intermittently two D-8 and two D-9 bulldozers and a 1 3/4 yard dragline.

(20) Ballarat Mines Limited — 115 O 14
Quartz Creek — (63°47'N, 139°06'W)

Reference: Sinclair et al (1976, p. 180).

The Schmidt operation was similar to that in 1975, mining on the right limit of Quartz Creek on Claims 20 and 21. A cut 500 feet long by 150 feet wide was made in uniform gravels to 50 feet deep of which the lower 15 feet is sluiced. Two D-8 bulldozers are used in moving gravels to a D-8 powered elevator conveyor system which provides for removal of gravels from the mining area and a high tailings discharge. Water is pumped from Quartz Creek and re-circulated.

(21) J. Lamontagne
Eldorado Creek
115 O 14
(63°51'N, 139°15'W)

Reference: Sinclair et al (1976, p. 180).

Mr. Lamontagne prepared ground during the 1976 season at the junction of Eldorado Creek and Chief Gulch using a D-6 bulldozer. He stripped some 30 feet of organic muck containing much woody material from a left limit cut 500 feet long by 100 feet wide below the junction of the two creeks. On Eldorado Creek above the junction 15 to 20 feet were stripped from an area 400 feet by 100 feet in which sand and gravel lenses are present within the muck section. Bedrock is a fissile chlorite schist.

(22) D. Johnson
Eldorado Creek
115 O 14
(63°52'N, 139°16'W)

D. Johnson holds a total of 10 claims on Eldorado, Gay Gulch and Oro Gulch. He started on the creeks in 1973 doing hand mining and testing. In 1975 he began mining with a 920 Series rubber-tired, front end loader having 1 3/4 yards capacity. During the two season, 1975 and 1976, he put in a cut 200 feet long by 100 feet wide on Eldorado just below the mouth of Gay Gulch. Normally he strips 10 feet of overburden and sluices the lower 8 to 15 feet, although the pay is strongly concentrated at bedrock. The bedrock is a muscovite-chlorite schist with abundant quartz veins. Production was approximately 300 crude ounces gold in each of 1975 and 1976.

(23) E. Gilmer
E. Vandehey
Eldorado Creek
115 O 14
(63°53'N, 139°18'W)

These operators hold by lease and ownership Claims 27, 27A and 28 on Eldorado Creek and the first claim on Nugget Gulch. They started testing in 1975 using a 4 inch diameter suction dredge and mined in 1976 with two Allis Chalmers tractors (D-4 equivalent), one as a bulldozer, the other as a front end loader. During the mining season they stripped roughly 10,000 cubic yards of waste and sluiced about 4,000 cubic yards, producing 160 crude ounces gold from gravels grading $7.50 per cubic yard.

Mining is on a left limit bench a few feet above the creek bed. The section consists of 4 to 5 feet of moss and peat underlain by about 20 feet of muck, then 2 to 4 feet of pay gravel. They rip the top foot of bedrock and recover most of the coarse gold from there.

(24) R. and B. Johnson
Eldorado Creek
115 O 14
(63°53'N, 139°20'W)

Reference: Sinclair et al (1976, p. 180).

R. and B. Johnson continued working the left limit bench at No. 11 Eldorado. During 1976 they worked part time, largely stripping with monitor and a D-6 bulldozer. The bedrock of the bench is about 140 feet above creek level. The grey, decomposed schist is overlain by 5 feet of white quartz and schist fragments in which the gold grains are thick. Above this is a reddish brown dirt and gravel section 20 feet thick which carries a small amount of gold.

(25) B. Bryant — 115 0 14
Upper Bonanza Creek — (63°55'N, 139°16'W)

Reference: Sinclair et al (1976, p. 18).

Mr. Bryant holds Claims 19, 20 and 21 on Upper Bonanza Creek at the mouth of Gauvin Gulch, 3 bench claims on the right limit of Gauvin Gulch and approximately 2 miles in claims and leases on the gulch itself. The principal mining target is the White Channel gravel deposit which forms a bench on the gulch 150 feet above Upper Bonanza Creek. 1976 operations were plagued by equipment breakdowns, especially of the pump which was to deliver water from the creek to the bench, but to the two D-8 bulldozers as well, reducing sluicing to 8 hours on Gauvin Gulch and 22 hours on Upper Bonanza Creek.

(26) F. Perret — 115 0 14
Bonanza Creek — (63°55'N, 139°13'W)

Reference: Sinclair et al (1976, p. 181).

Mr. Perret, who has mined for several years on upper Bonanza down from the mouth of Victoria Gulch, did not sluice during the 1976 season, but did prepare some ground for future mining.

(27) D. Coombs — 115 0 14
Bonanza Creek — (63°48'N, 139°08'W)

Reference: Sinclair et al (1976, p. 180).

Mr. Coombs during 1976 mined Upper Bonanza Creek on the second claim below the mouth of Ready Bullion Creek, putting in a cut 150 feet long by about 50 feet deep, the full width of the narrow valley. He mines a section 10 feet deep, consisting of 2 feet of platy muscovite-chlorite-quartz schist, 3 to 4 feet of angular schist and gneiss fragments and 5 feet of brown, silty soil with slide rock fragments. Coombs mines by pushing the gravels, slide rock and broken bedrock to the elevated, wooden sluice box. A 3/4 yard dragline moves the material to the dump box of the sluice. The gold, rough and coarse, is caught in the punch plate of the dump box and in the upper few riffles of the sluice. Water is pumped to the sluice and recirculated from the settling pond.

(28) H. Yoder — 115 0 14
Adams Gulch — (63°55'N, 139°23'W)

Mr. Yoder mined on Claims 8, 9 and 11 on Adams Gulch for about one month during 1976, using a front end loader and sluicing a small amount of gravel.

(29) G. Caley — 115 0 14
Adams Gulch — (63°55'N, 139°24'W)

Mr. Caley has mined on Adams Gulch, a left limit tributary of Bonanza Creek, since 1975, holding Claims 6 and 12 to 19 inclusive. Using a D-7 bulldozer he put in a series of centre cuts on Claims 13, 14 and 15, mining about 750 feet of the creek in 1975 and the same in 1976. Each cut, 50 to 80 feet wide is about half the width of the narrow gulch and 175 feet long. He strips about 17 feet of muck. The gravel section of about 3 feet has been thoroughly hand mined and essentially all the gold recovered is from the top foot of broken bedrock.

(30) J. and R. Archibald — Bonanza Creek — 115 O 14 (63°58'N, 139°20'W)

Reference: Sinclair et al (1975, p. 169).

J. and R. Archibald continued mining on Bonanza where they have operated since 1966, putting in a cut 250 feet long by 150 feet wide at the south end of their 3 bench claims. The bench, on the right limit of Bonanza, is here 150 feet above the creek. The section consists of 8 to 10 feet of fine muck and 20 feet of gravel. The slabby quartz-chlorite schist bedrock with steeply dipping foliation has trapped the gold and 4 to 6 feet of bedrock is successfully mined. Equipment used is 2 D-6 bulldozers and pump.

(31) C. Nicholson — Lovett Hill — 116 B 3 (64°02'N, 139°23'W)

Mr. Nicholson during 1976 completed the cut worked on in 1974 and 1975 on Lovett Hill in largely White Channel gravels on Lovett Discovery Claim. The cut totals approximately 13,000 bedrock square feet, some 9,000 of which was mined during 1976. Equipment used was a D-6 bulldozer for stripping and a 920 series 2 yard front end loader for feeding the grizzly mounted sluice. Water is pumped in two stages from Bonanza Creek. The first lift is 200 feet to a clay lined holding pond; the second a further 40 feet to the sluice. Tailings water filters through tailings back to the pond and is recirculated. The back side of the cut is roughly 30 feet high. The lower 5 feet of chloritic quartzite bedrock is sluiced. The bedrock surface is irregular with the best pay here being on a bedrock high.

(32) Territorial Gold Placers Limited — Black Hills Creek & Henderson Creek — 115 O 6, 7 (63°27'N, 138°50'W) (63°24'N, 139°07'W)

Reference: Sinclair et al (1976, p. 183).

The 1976 operations of this company on Black Hills Creek were just upstream from the mouth of Larsen Creek. Six cuts in the middle of the valley, and on the left limit, a total area 300 by 350 feet, were mined. The section consists of some 4 to 6 feet of gravel overlain by 6 to 8 feet of black muck and peat. In addition to the above, two side-by-side cuts were mined on the right limit just above the mouth of Dome Creek; the area being 300 feet long by 225 feet wide. Bedrock in this part of the Black Hills Creek valley is a flaggy quartzese schist. Production for the 1976 Black Hills operation was 1,955 troy ounces of crude gold averaging 760 fine, from 61,200 yards of gravel sluiced.

On Henderson Creek mining was at and upstream from Golden Gate Creek. Mining the complete valley bottom, the company put in seven cuts totalling 53,000 cubic yards of gravel from an area 200 to 250 feet wide by 1200 feet long. The section consists of about 5 feet of gravel overlain by 6 to 8 feet of organic muck. Bedrock here is also a quartz rich schist. Production from Henderson Creek for 1976 was 2,216 ounces crude gold, averaging 720 fine.

An area 5 miles downstream from the 1976 working was stripped in preparation for 1977 mining.

Du Pont of Canada Exploration Limited | 116 B 3
Hunker Creek | (64°01'N, 139°12'W)

Reference: Sinclair and Gilbert (1975, p. 129).

Claims: BBDU 1, 2, 3

Prospecting Leases: PL 3830, 3831

Location and Access:

The claims and leases are situated at the Junction of the Dawson-Stewart Crossing Highway and the Hunker Creek road.

Description:

The prospecting leases cover undredged terraces with placer potential between Bear Creek and Arlington at the mouth of Hunker Creek.

Current Work and Results:

A topographic reconnaissance survey at a scale of 1:10,000 was conducted on the leases and claims. Seven holes were drilled by a 11.4 cm (ID) Becker churn drill on the leases and BBDU-3.

MAYO-McQUESTEN AREA

(1) Bardusan Placers Limited
Thunder Gulch
105 M 14
(63°55'N, 135°15'W)

Reference: Sinclair et al (1976, p. 184).

H. Barchan holds 3 miles on Lightning Creek from just above Keno City and miles of Thunder Gulch up from the mouth. During 1976 he mined on Claim 7 above the mouth of Thunder Gulch, putting in one cut 300 feet long, 50 feet wide and up to 45 feet deep, (approximately 25,000 cubic yards) using a D-7 bulldozer and a 3 cubic yard capacity rubber tired front end loader. There is a change in bedrock type from quartzite to an increasing proportion of schist farther up the creek. The gravels thicken upstream, resulting in a significant increase in the thickness of the section mined.

(2) W. Malicky and M. Alexander
Duncan Creek
105 M 14
(63°52'N, 135°15'W)

These men mined for two weeks on Upper Duncan Creek during the 1976 season in the canyon one mile above the mouth, using a D-8 bulldozer and a John Deere front end loader, sluicing 6 feet of gravel and 2 to 3 feet of bedrock. The ground, heavily hand mined earlier, as indicated by numerous old workings, contains remanant pockets of high grade gravels.

(3) F. Taylor and J. Brooks
Duncan Creek
105 M 14
(63°52'N, 135°27'W)

Reference: Sinclair et al (1976, p. 184).

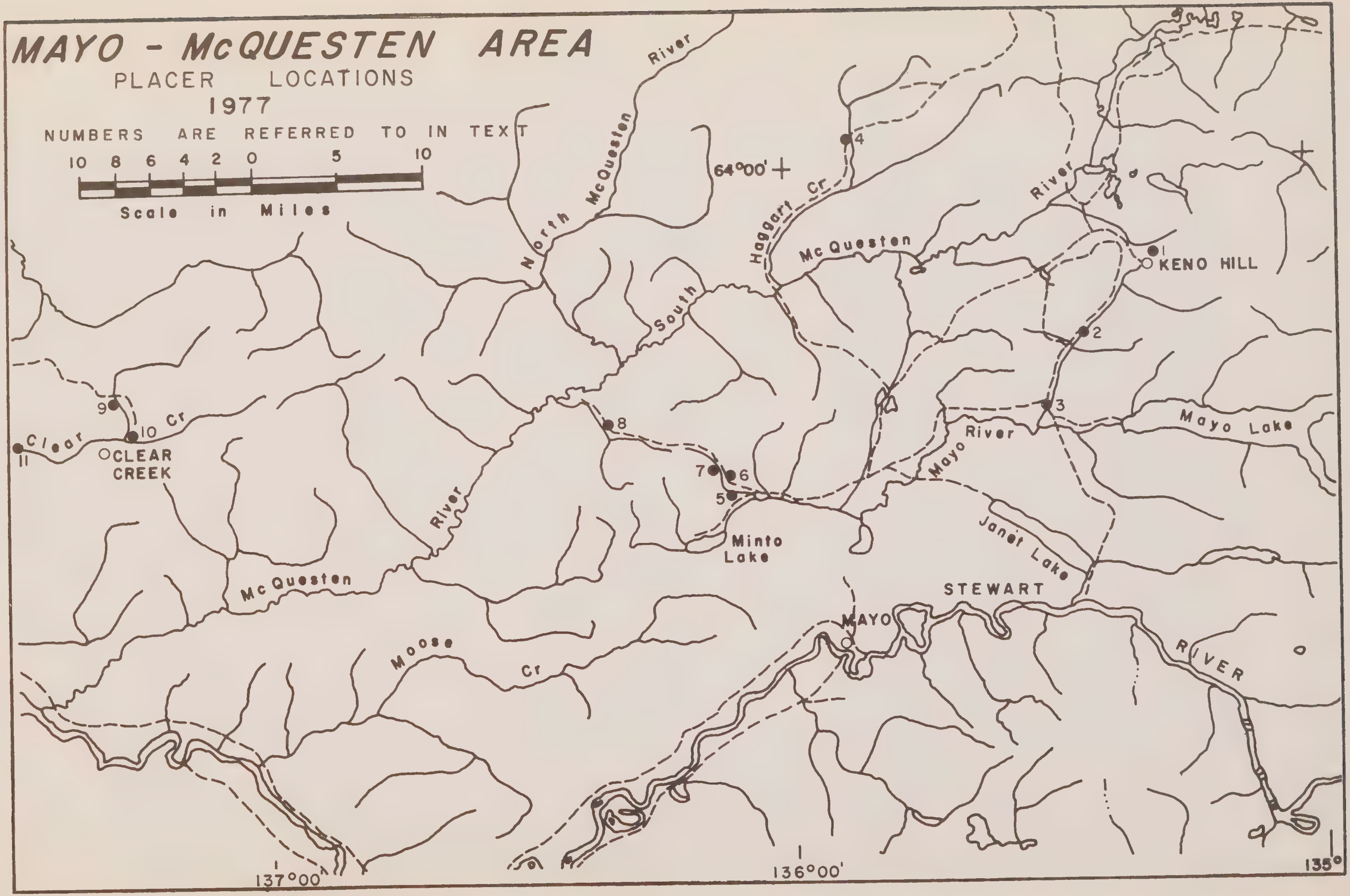
During 1976 these operators continued mining on Duncan Creek, working through a narrow section of the creek valley on the upper part of Claim 2 and lower part of Claim 3. Left limit cuts 60 to 120 feet wide averaging 7 feet deep totalling 600 feet along the creek were made. A 3 1/2 cubic yard capacity rubber tired front end loader was used to feed gravels to the sluice with a grizzly above to reject large boulders. Still larger boulders are simply moved aside by the loader.

(4) Darron Placers
Dublin Gulch
106 D 4
(64°02'N, 135°50'W)

Reference: Sinclair et al (1976, p. 185).

During 1976 R. Holway and D. Duensing with a crew of 4 hired men put in one cut of 16,000 cubic yards on the extreme left limit of Dublin Gulch at the upper end of Claim 3, sluicing up to 40 feet of gravel. A second cut of 27,000 cubic yards was made 500 feet downstream of the first on Claim 2. Using both bulldozers and a monitor they strip up to 70 feet of silt with abundant ice on the bank side of the cuts. They used the same mining equipment as in 1975.

During the season a major effort was made to recover the abundant fine scheelite. A drop box was placed at the lower end of the main sluice, conveying the fines into a second sluice box. The concentrate from this, containing fine gold and scheelite was stored in 45 gallon drums for further processing.


MAYO - McQUESTEN AREA
PLACER LOCATIONS
1977
NUMBERS ARE REFERRED TO IN TEXT
10 8 6 4 2 0 5 10
Scale in Miles
North McQuesten River
South
McQuesten
River
Haggart Cr
64°00'
KENO HILL
Mayo Lake
Mayo River
Janet Lake
Minto Lake
STEWART
RIVER
MAYO
Moose Cr
Clear Cr
CLEAR CREEK
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137°00'
136°00'
135°

(5) <u>E. and L. Bleiler</u> — 115 P 16
Highet Creek — (63°44'N, 136°08'W)

<u>Reference</u>: Sinclair <u>et al</u> (1976, p. 184).

These men mined along the left limit of the creek, the center having been worked thoroughly by earlier miners, ending about 500 feet below McRae Creek, putting in 6 cuts, each an average of 140 feet long and 80 to 100 feet wide. Of the gravel section, 20 feet deep, roughly half is stripped and half sluiced; the amount sluiced during the season being 55,000 cubic yards. Equipment consists of a D-8, a 1 3/4 cubic yard tracked front end loader and a 4 cubic yard front end loader.

(6) <u>W. Gordon and W. Tuck</u> — 115 P 16
Rudolf Gulch — (63°46'N, 136°09'W)

<u>Reference</u>: Sinclair <u>et al</u> (1976, p. 185).

These men prospected the creek in 1975, staking a 1 mile lease on Rudolf Gulch and 2,000 feet on Highet Creek immediately below Rudolf. Mining immediately up from the mouth of Rudolf Gulch, these operators put in one cut 50 feet by 100 feet long and one 50 feet long taking in the full width of the gulch. The unconsolidated section is some 15 feet thick consisting of about 4 feet of unsorted stream gravel containing granitic boulders to 3 feet in diameter followed upwards by 3 feet of limonite cemented, angular, quartz-muscovite schist slide rock. Above this is 3 feet of manganese stained and cemented slide rock with minor quartz pebbles with the remainder of the section being uncemented, largely slide rock material. The pay is erratic but concentrated adjacent to the large granite boulders. Scheelite is present at the mouth where Rudolf joins Highet Creek.

Water is provided by a ditch, 200 feet of 10 inch pipe and a 3 inch diameter monitor, used largely for stripping the slide rock. Gravel is moved to the sluice and tailings stacked by two small front end loaders - a rubber tired 1 1/2 yard and a small tracked loader.

(7) <u>F. Erl</u> — 115 P 9
Highet Creek — (63°45'N, 136°09'W)

<u>Reference</u>: Sinclair <u>et al</u> (1976, p. 184).

Mr. Erl holds a total of 16 claims on the upper part of Highet Creek. During 1976 he mined on the lowest of these, immediately upstream from the mouth of Rudolf Gulch. Here a series of right limit benches contain small amounts of gravel and abundant sericite phyllite and schist slide rock. Mr. Erl worked the second bench, approximately 100 feet above the creek, putting in one small cut 40 feet by 50 feet. He strips about 10 feet with a D-8 bulldozer and moves the remaining 8 feet plus a foot or so of the soft bedrock to the grizzly equipped sluice with a tracked 1 1/2 yard front end loader. Water is supplied to the workings by means of a 1 mile ditch and 200 feet of 6 inch diameter pipe allowing the use of a low pressure monitor.

(8) C. and H. Klippert — 115 P 15
Johnson Creek — (63°47'N, 136°21'W)

Klipperts own 10 claims on Johnson Creek, downstream from the mouth of Sabbath Creek, on the west side of Scheelite Dome. Starting on the 4th claim from the downstream end of the property, they did 2 weeks of stripping of black muck with a TD-25 bulldozer and a rubber tired front end loader and a few hours of test sluicing.

(9) W. Genier and T. Thompson — 115 P 14
Clear Creek — (63°51'N, 137°10'W)

Reference: Sinclair et al (1976, p. 185).

These operators hold 4 miles of Clear Creek; during 1976 they mined 2,000 feet downstream from Lewis Gulch, mining the full width of the creek gravels, 200 feet. They mined 500 feet along the creek giving a total of approximately 100,000 bedrock square feet. The gravel section is 10 to 12 feet thick of which the bottom 6 to 7 feet is sluiced. Boulders up to 4 feet in diameter complicate the mining. The lower control on the mining is a blue grey clay, the decomposition product of the graphitic phyllite bedrock.

(10) Clear Creek Gold Mines — 115 P 14
Clear Creek — (63°48'N, 137°16'W)

Reference: Sinclair et al (1976, p. 185).

W. Scott and L. Logie with a crew of 4 hired men mined on Barney Gulch, a left limit tributary of Clear Creek, making a full width cut 100 feet wide up the gulch. They work with one D-8 and one D-6 bulldozer.

(11) G. Regimbald — 115 P 13
Clear Creek — (63°45'N, 137°38'W)

G. Regimbald holds 4 miles of leases on Clear Creek up from the mouth of Barlow Creek. During the 1976 season he did 5 weeks of preparatory stripping with a D-7 bulldozer and test pitting on the second and third miles up from Barlow Creek. A small, 4 inch suction dredge was used in the testing and found to be effective where the gravels were fine and uniform.

Fourth of July Creek
Dupont of Canada Exploration Limited

115 G 1
(61°10'N, 138°03'W)

Reference: Muller (1967).

Claims: Placer Leases 3089 and 3354

Location and Access:

The leases are located in the Ruby Mountain Range about 53.1 km northwest of Haines Junction on the Fourth of July Creek. Access to the property is by air to a small airstrip on the south end of the property. There is also a 48.3 km tote road to the property from the Alaska Highway via Cultus Creek.

History:

Recent work has consisted of building the airstrip and tote roads up the creeks and also some trenching. Some shafts were sunk and production attained in the period 1910-1914.

Description:

The area of the property is underlain by the Yukon Schist Complex. Overlying this is a boulder till which is in turn overlain by recent gravels.

Current Work and Results:

A refraction seismic survey using a 12-channel seismic refraction system with 331 m spreads and explosives was used. Bedrock was determined on only two lines because of permafrost and/or too great a depth to bedrock. Depth to bedrock on these lines varied from 45.7 m to 122 m. No buried stream channels were identified. Stream and bank material were sampled for gold and heavy mineral content.

KLUANE AREA

<u>Burwash Mining Company Limited</u> 115 G 6
Burwash Creek (61°23'N, 139°17'W)

Reference: Sinclair *et al* (1976, p. 186).

H. Besner, with 2 hired men, mined the first claim on the downstream end of his Burwash Creek holdings, putting in a cut 150 feet wide by 200 feet long and 20 feet deep in bouldery gravel. Equipment used was that of previous years - two D-8 bulldozers and a 3/4 yard power shovel.

<u>W. Jones</u> 115 G 6
Burwash Creek (61°23'N, 139°19'W)

Mr. and Mrs. Jones mine on the upper 2 claims of H. Besner on Burwash Creek above the mouth of Tetamagouche Creek, starting in 1975. In 1976, operating with a D-8 bulldozer and a rubber tired front end loader they put in one right limit cut 100 by 200 feet and stripped the overlying muck and some gravel from a second area 200 feet by 300 feet.

LIVINGSTONE CREEK

Constellation Mines
Livingstone Creek

105 E 8
(61°22'N, 134°20'W)

Reference: Sinclair *et al* (1976, p. 187).

M. Furstner holds 36 creek claims and 3 bench claims on Livingstone Creek. During 1976, Furstner, R. Miller and G. McCully mined on Discovery Claim, leased from B. Mosby, sluicing roughly 10,000 cubic yards of gravel. The gravel section is irregular, but up to 40 feet thick, all of which is sluiced. Water is conveyed by ditch and a 1,300-foot pipeline, reduced in diameter from 12 inches through 10 inches to 8 inches and available at the monitor with a head of 300 feet.

R. Asuchak, J. Nakamura, G. Asuchak
Moose Creek

105 E 8
(61°17'N, 134°20'W)

Reference: Sinclair *et al* (1976, p. 187).

These men hold 4 claims up from the mouth of Moose Creek, a left limit tributary of Big Salmon River. Mrs. G. Asuchak holds a two mile lease on Big Salmon downstream from Moose Creek. The operators sluiced for a week in early August and made repairs to the airstrip built in 1975. Moose Creek emerges from a narrow canyon for 600 feet before flowing into the Big Salmon River. Work to date has been on this lower portion of the Creek. Boulders to 6 feet in diameter are present in a gravel section up to 20 feet thick over irregular bedrock.

G. Asuchak also worked on nearby Lake Creek in the spring, stripping with a monitor.

DAWSON RANGE AREA

H. Larsen
Nansen Creek

115 I 3
(62°04'N, 137°13'W)

H. Larsen holds a one mile lease on Nansen Creek and a one mile lease on Discovery Creek, starting from the mouths. He did some stripping and test mining with a D-8 bulldozer. Angular gravels are 6 to 10 feet thick.

J. Yaklin
Nansen Creek

115 I 6
(62°06'N, 137°10'W)

Reference: Sinclair et al (1976, p. 190).

Mr. Yaklin continued mining on Nansen Creek, working claims No. 7 and 8 Above the mouth. He monitored one cut 14 feet wide by 200 feet long to 12 feet deep without reaching bedrock. A second cut, 75 feet long, 45 feet wide and 10-12 feet deep was put in. Pay is in the bottom 1 1/2 feet of this cut immediately above a clay horizon.

G. Van Bibber and A. McDiarmid
Sonora Gulch, Hayes Creek

115 J 9
(62°40'N, 138°03'W)

These men hold a one mile lease on Sonora Gulch, a left limit tributary of Hayes Creek. Starting in 1975, they continued preparations for mining in 1976, doing largely stripping but some sluicing as well. Equipment used was a Caterpillar 920 rubber tired front end loader and a John Deere tracked front end loader.

Silgo Mines Limited
Canadian Creek

115 J 15
(62°45'N, 138°50'W)

Mr. R. MacKamey mined for about 10 days on Canadian Creek 600 feet above the confluence of Patton Gulch and Canadian Creek, on claims held by R. Carlson. Equipment used was a TD-25 bulldozer and a 4 yard rubber tired Michigan front end loader. As well as a small amount of gold roughly one-half ton of tungsten concentrate was recovered. Operations were seriously held up by a shortage of water and equipment problems.

CORE STORED IN LIBRARY

COMPANY	PROPERTY	N.T.S.	No. of HOLES	REMARKS
Sovereign Metals Ltd.	Mel	95-D-6	8	C
Archer Cathro Hyland Joint Venture	Porker Claims	95-D-5, 12	4	C
Archer Cathro	Nite Claims	105-B-7	6	C
Boswell River Mines	Boswell River	105-C-13	spilled	C
Arctic Gold & Silver Mines Limited	Arctic Mine	105-D-2	15	C
International Mine Services	Peerless Claims Arctic Mine Area	105-D-2	14	C
Venus Mines	Montana Mt.	105-D-2	64	C
M. Nichiporich	Sekulman	105-D-9	11	C
Whitehorse Copper	Valerie	105-D-10, 11	1	C
United Keno Hill	King Lake	105-D-14	1	C
Joe Lindsay	Quiet Lake	105-F-3	3	C
Canalask Nickel Syndicate	Micro	105-F-15, 16	1	C
Finalyson Joint Venture-Archer Cathro	Fetish	105-G-8	4	C
Cyprus Explorations	Lyn	105-K-3	4	
Cyprus Anvil	Rose Creek	105-K-6	11	C
Northern Homestake	Hal Claims	105-K-11	2	C
Ogilvie Joint Venture	Jason	105-0-1	20	C
Hudson Bay	Tom	105-0-8	61	C
McIntyre Mines	Tom	106-B-4	1	C
Norcen Energy Res. (Great Plains)	Harrison Creek	106-C-7	3	C
Archer Cathro Ogilvie Joint Venture	Pterd	106-C-14	5	C
Archer Cathro	Bond	106-D-10	3	C

COMPANY	PROPERTY	N.T.S.	No. of HOLES	REMARKS
Archer Cathro Ogilvie Joint Venture	Flunk	106-E-2	3	C
Archer Cathro Ogilvie Joint Venture	M.S.T.	106-E-3	3	C
Canex Placer	Panther Claims B.C.	114	6	C
Jackpot Copper	Tatshenshini	115-A-3	4	C
Phelps Dodge	Green Eagle, Joy	115-A-8	1	
Hudson Bay	Quill Creek	115-G-5	52	C
Hudson-Yukon Mining Company Limited	Wellgreen	115-G-5	65	C
Imperial Oil	Cork	115-G-6	10	C
Teslin Expl. Ltd.	Teslin	115-H-8	1	C
Arjay Kirker Resources Ltd. (Archer Cathro)	Division Mtn.	115-H-8	6	C
Arsenault/Versluce	Mack's Copper	115-H-9	1	C
Tantalus Butte Mine Anvil Mining Corp.	Tantalus Butte	115-I-1	5	C
Cyprus Explorations	Mt. Nansen	115-I-3	10	C
Area Explorations	Mt. Nansen	115-I-3	2	C
Cyprus Explorations	Mt. Nansen	115-I-3	3	C
Kangaroo (Cyprus)	Mt. Nansen	115-I-3	5	C
Archer Cathro	Cash (Fox, Bear, Car)	115-I-5	20	C
Rayrock Mines	Laforma Property	115-I-6	2	C
Dawson Range Joint Venture (Archer Cathro)	Williams Creek (Boy)	115-I-7	5	C
Canex Aerial Expl.	March (Granite Mtn.)	115-I-7	10	C
United Keno Hill	Minto	115-I-11	1	C
Kerr Addison	Won	115-I-13	6	C
Occidental Petroleum	Pelly & Dary Claims	115-I-14	3	C
Beach Gold Mines	Ura	115-P-13, 14	4	C

C in Remarks indicates that core is confidential and permission of company is required for viewing.

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Vancouver, B.C. V6B 1L8

Falconbridge Nickel Mines Ltd.
700-1112 W. Pender St.
Vancouver, B.C. V6E 2S1

Getty Mining Pacific
622-510 W Hastings St.
Vancouver, B.C. V6B 1L8

Granby Mining Corp.
17th Floor - 1050 W Pender St.
Vancouver, B.C. V6E 2H7

Great Bear Mining Ltd.
907-675 W Hastings St.
Vancouver, B.C. V6B 1N2

Harman Syndicate
907-675 W Hastings St.
Vancouver, B.C.

Highawk Mines Ltd.
333-885 Dunsmuir St.
Vancouver, B.C. V6C 1N5

Hudson Bay Expl. & Devel. Co. Ltd
P.O. Box 4007
Whitehorse, Y.T.

Kerr Addison Mines Ltd.
405-112 W Pender St.
Vancouver. B.C. V6E 2S1

Klotassin Joint Venture
c/o Archer, Cathro & Assoc.

Lobell Mines Ltd.
1230-10th Ave. SW
Calgary, Alta. T3C 0J2

Mackir Mining Ltd.
309-330 9th Ave. SW
Calgary Alta. T2P 1K7

MacMillan Joint Venture
c/o Conwest Exploration Co. Ltd.
10th Floor - 85 Richmond St. W
Toronto, Ont. M5H 2G1

Mark V Petroleums Ltd.
301-580 Granville St.
Vancouver, B.C. V6C 2K3

McIntyre Mines Ltd.
1003-409 Granville St.
Vancouver, B.C. V6C 1T2

Metalgesellschaft Canada Ltd.
824-602 W Hastings St.
Vancouver, B.C. V6C 1X8

Mitsubishi Metal Corp.
2766 Granville Square
200 Granville St.
Vancouver, B.C. V6C 1S4

Mountaineer Mines Ltd.
907-675 W Hastings St.
Vancouver, B.C.

Mount Nansen Mines Ltd.
420-475 Howe St.
Vancouver, B.C. V6C 2B3

New Minex Resources Ltd.
1035 Richards St.
Vancouver, B.C. V6B 3E4

Noranda Exploration Co. Ltd.
202-4133 Fourth Ave.
Whitehorse, Y.T. Y1A 1H8

Norcen Energy Resources Ltd.
736-8th Ave. SW
Calgary, Alta. T2P 1H4

Ogilvie Joint Venture
1860 Granville Square
Vancouver, B.C. V6C 1S4

Petra Gem Expl. of Canada Ltd.
200-3540 West 41st Ave.
Vancouver, B.C. V6N 3E6

Preussag Canada Ltd.
414-850 W Hastings St.
Vancouver, B.C. V6C 1E1

Rio Alto Exploration Ltd.
736-8th Ave.
Calgary Alta. T2P 1H4

Rio Tinto Canadian Exploration Ltd.
615-Two Bentall Center
555 Burrard St.
Vancouver, B.C. V7X 1M8

Silver Standard Mines Ltd.
904-1199 W Hastings St.
Vancouver, B.C. V6E 3T5

Shell Canada Resources Ltd.
P.O. Box 100
Calgary Alta. T2P 2H5

Sovereign Metals Corp.
5th Floor -134 Abbott St.
Vancouver, B.C. V6B 2K4

Sproatt Silver Mines Ltd.
333-307-One Howe St.
Vancouver, B.C. V6C 1N5

Swim Lake Mines Ltd.
307-One Howe St.
Vancouver, B.C. V6C 2B3

Teck Corp. Ltd.
1199 W Hastings St.
Vancouver, B.C. V6E 2K5

Tintina Silver Mines Ltd.
c/o T.R. Tough and Assoc. Ltd.
500-1075 Melville St.
Vancouver, B.C. V6E 2W4

Thor Explorations Ltd.
301-580 Granville St.
Vancouver, B.C. V6C 2K3

Trident Resources Ltd.
c/o Agilis Engineering

Ukon Joint Venture
c/o Archer, Cathro and Assoc.

Union Carbide Canada Mining Ltd.
601-1112 W Pender St.
Vancouver, B.C. V6E 2S1

Union Miniere Expl. & Mining Co. Ltd.
200-4299 Canada Way
Burnaby, B.C. V5G 1H4

United Keno Hill Mines Ltd.
Exploration Dept.
405 Main St.
Whitehorse, Y.T.

Utah Mines Ltd.
1600-1050 W Pender St.
Vancouver, B.C. V6E 3S7

Vangorda Mines Ltd.
Box 91 Commerce Court West
Toronto, Ont. M5L 1C7

Welcome North Mines Ltd.
1027-470 Granville St.
Vancouver, B.C. V6C 1V5

Wernecke Joint Venture
c/o Archer, Cathro & Assoc.

Western Mines Ltd.
1103-595 Burrard St.
Vancouver, B.C. V7X 1C4

Whitehorse Copper Mines Ltd.
P.O. Box 4280
Whitehorse, Y.T. Y1A 3T3

Yukon Revenue Mines Ltd.
117 Industrial Rd.
Whitehorse, Y.T. Y1A 2T8

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